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ABSTRACT

Designed to provide the educator with some answers about cable television (CATV), this monograph and resource catalog provides a basic description of CATV, its educational uses, and the franchising provisions which relate to its educational uses. The transition of CATV from an association with broadcast television toward cable information systems is a central theme of the document--its two-way capability, hands-on access, local origination, increased channel capacity, reduced costs, Federal Communications Commission rulings, and the implications of these technological advancements and policy changes for education and for society. Practical suggestions are made to the educator; information is provided about forces operating on cable's development; and recommendations are offered about franchising processes. In addition, alternative forms of ownership and extensions on "two-people-on-a-log" formatting are discussed. Appended are footnotes and a bibliography designed to help those who wish to readily examine any area in more detail. (Author/SH)

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By Jon Shafer

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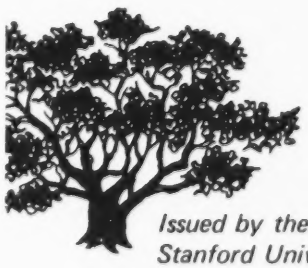

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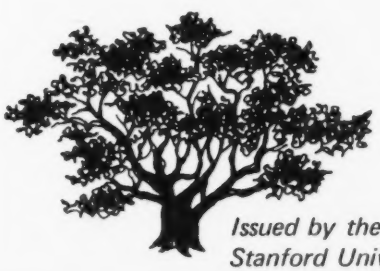

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Jon Shafer is a freelance writer and teacher in cable communications from Minneapolis, Minnesota. He has also been active through a wide variety of organizations in cable's development, particularly the American Friends Service Committee in maximizing community involvement.

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PREFACE

This monograph/resource catalogue was written/produced so that the educator could have under one cover a basic description of cable television, its educational uses, and the franchising provisions which relate to its educational uses. In addition, sufficient references (in footnotes or bibliography) are cited to enable those who wish to readily examine any area in more detail.

An earlier version for regional use without the bibliography and glossary was commissioned by the Educational Research and Development Council of the Twin Cities Metropolitan Area, Inc. of St. Paul, Minnesota. They have graciously consented to allow the author to draw upon that document.

In large part this document was designed to provide the educator with some answers to the question: "What should I do about cable TV?" The answers suggested here relate–not to how many coaxial cables you should plan for your building's conduit–but instead to what action is advisable at the municipal and state levels if the potential of cable for educational use is to be realized. And because the product is dependent upon the process which creates it, considerable attention is given to the details of the franchising process that are important to education.

This emphasis on franchising results from the unique situation which exists today as cable communications systematically enter the 100 largest metropolitan areas for the first time. The granting of franchises by municipalities in these urban areas will lay the foundation for a communications system which will have a far-reaching effect on our society. The combination of cable with other advances in communications technology has generated a cybernetic revolution whose impact on our civilization will likely equal or surpass that of the industrial revolution. As Parker and Dunn have stated, "The main difference between the present period of technological change and the earlier periods is that our society now has a greater opportunity to direct the development of the technology to meet positive social goals, instead of becoming the beneficiary (or victim) of uncontrolled technological change."[1] This control question will be answered before 1980, and perhaps before 1975 in a number of areas.

How it is answered is largely contingent upon the degree of informed public involvement in cable's development. It has taken several hundred years for effective public pressure to tame the industrial cyclops with its super-strength muscles misguided by lack of perspective. Harnessing the cybernetic revolution–to accomplish positive social goals–must be done the first time around, or not at all.

What you must do at the national level,
and particularly within the communities where you live,
is immerse yourselves in the decision-making process.

You must come to that bargaining session
steeped in the lessons of fifty years of regulatory giveaways
and armed with the spirit of the law,
the facts of the technology,
and the imagination to out-man those
whose power comes from the mouth of their lobby
and the persuasiveness of their venture capital.

If you fail,
you will have the illusory satisfaction
of hearing future generations say:
Why didn't someone tell us about all this
when there was still time?

Your job is to say it now,
to document it now,
when you can still make a difference.
You can, you know.[2]

–Fred W. Friendly

I. AN INTRODUCTION TO CABLE

The most important thing to know about cable television is that it is *not* just television received through a cable. Cable systems are like icebergs–many dimensions of their forms are hidden from first glance. Even though cable television has changed completely and become a two-way decentralized medium, most people still harbor vestigial associations of cable TV with broadcast TV. To understand the rebirth that CATV (community antenna television) is undergoing to become CIS (cable information systems) requires a brief glance at the past. Only then can one fully comprehend the magnitude of change involved, and develop an adequate sense of perspective.

History

Cable television began as a community antenna service in 1949 in the valleys of Pennsylvania and Oregon, where towns were shut off from broadcast television signals because of the surrounding hills. Cable's sole purpose was to extend the range and signal quality of over-the-air television. Antennas were placed on a tower atop a neighboring hill, and coaxial cable was run from the tower through the town on existing utility poles. Branches off the "trunk" and "feeder" cables, called "drops," carried the television signal from the street into the home, where connection was made to the antenna terminals on the back of the television receiver. For this improved reception service, subscribers generally paid from three to six dollars per month.

Past and present CATV systems also include electronic equipment at the base of the community antenna. This is housed in a small building, which sometimes also serves as a studio, and is called a "headend." The electronic equipment improves the quality and the strength of the television signals before feeding them into the coaxial cable. Several amplifiers per mile of cable are necessary to maintain signal strength, though there is some decrease in quality. Because of this degrading effect on the signal quality, the practical length of the cable running from the headend is limited.[3]

While early cable systems often had only a four to six channel capacity, the capacity using today's equipment is approximately 30 channels per cable, using "off the shelf" amplifiers. With dual, and even triple, trunk cable systems coming into existence, 60 to 90 channel capacity is therefore possible. Fifty-four and eighty-one channel systems are already in existence.

Educational Uses

This greatly increased channel capacity opens the door to educators, permitting highly specialized, even individualized, uses of the cable system for distribution of educational material. *Cable Television in Detroit: A Study in Urban Communications* describes some general educational uses of cable as follows:

> *Resources such as course offerings and special speakers could be shared between institutions. In the area of adult education, for example, minicampuses in branch libraries, store fronts, union halls, and churches could be linked via cable to a central educational cable-casting facility. Or those who have left the educational process because of age, ill health or lack of interest or success and who are reluctant to attend an educational facility, might be induced to attend classes in the privacy of their homes. In short, cable television can obviate many space, transportation and scheduling limitations of the present educational system.*[4]

Other more specific opportunities created by a cable system are outlined by the Metropolitan Nashville Education Association:

1. Redistribution of open circuit instructional TV programs at times most needed.
2. Showing of films from central library over cable system (film previews for teachers).
3. Programs for segmentized audiences to serve unique needs (i.e., second language program for those who do not speak English).
4. Teacher education programs: (a) links to university, (b) credit courses for teachers, (c) inservice education.
5. High school equivalency and college extension courses (open university).
6. Information retrieval, dial access (central bank).
7. Live production for pupils to exchange programs with other pupils and other schools (drama student access, etc.).
8. Teacher conferences via TV.
9. Adult education uses–vocational education.
10. On-job training needs of industry.
11. Computer-to-computer interface.
12. Preschool programs for children at home.
13. Professional programs for doctors (on non-standard channels).
14. High school news programs, teen discussion programs.
15. Student film producers' outlet.
16. Selective communications among schools within a given part of the city.[5]

Some of the above uses could be expanded for wider application. For example, item 13 could apply to any

profession, from architecture to zoology. Suggestion 14, news programs, could elicit specials such as a "First Monday" series on student and faculty research or science fair projects. Another idea, suitable for any level group, might be to tape record a verbal report for the children's parents and friends about a class outing or project. That only a few might be interested would not be a problem because of the hundreds of voice signals that can be carried using only a small portion of the cable's bandwidth.

Of course, it must be remembered that portable video tape recorders are nearing the simplicity of audio-tape recorders. Consequently, the ideas above could be carried out with approximately equal ease whether using the radio or television capability. Even if just an audio tape were prepared, a television camera could scan drawings or paintings done by the class, depicting individual versions of the project or the activity being described. With a small amount of effort, the audio and video could be coordinated. Another potential use of just the audio capability of the cable system is for "conference calls." Possibly before "picturephone" service is widely available from the telephone company, "videophone" will come into being through cable systems.

Regular school activities like plays, holiday programs, concerts, sporting events, and school board meetings are a significant source of material for cable use. Communication among the public, school board, administration, faculty, students, and parents regarding school issues could be facilitated using cablecast panel discussions, in-depth interviews with central figures, or televised call-in talk shows. It is important to remember that with the large number of channels in modern cable systems these programs can be repeated as often as needed, provided that the ordinance includes a sufficient number of channels for educational use.

Suggestion 15, student film producers' outlet, should be enlarged into a visual communications curriculum outlet. Students need to understand and operate the equipment of the new media and be able to use this knowledge as a means of communicating ideas. The potentials and limitations of the new media hardware, especially portable video equipment, must be discovered by each student and teacher.[6] Only the direct, personal use of television can end its technological and psychological intimidation. Once the use of portable television cameras becomes commonplace, it seems likely that television will become an everyday vehicle of expression, e.g., videophone use or widespread use of the public access channel. Because that day is rapidly approaching, the development of visual literacy—and specifically video self-expression ability—is being recognized increasingly as a central part of the communications skills people need in order to function effectively in today's TV society.[7]

A significant by-product of the uses of cable systems is its profound effect on the self-images of those seeing themselves on television. The logic behind the effect probably goes something like: "What you see on TV is important. I'm on TV. I'm important."[8] Though repeated television exposure may wear out this effect, its initial power should not be overlooked. One real life illustration of this force concerned a young boy who emerged from kindergarten into the first grade without having spoken during school. His first words, after seeing himself on a videotape playback, were, "What a beautiful boy!"[9]

In the near future, it seems a natural development for educational institutions to assume a large share of the responsibility for seeing that youth are taught how to express themselves effectively by using inexpensive video equipment on the public access channels. English grammar and speech will need to be augmented by courses on use of half-inch videotape equipment if freedom of speech is to become a reality.

One of the best ways for educational institutions to benefit from the coming of cable, while serving the community and the cable operator at the same time, is to establish student internships for helping facilitate use of the access channels (the public and governmental channels as well as the educational). Such an arrangement may be one of the few ways that sufficient community support could be generated to dependably enable the access channels to develop within the economic constraints which exist.

If only a few of these many potential uses are developed to any significant extent, multiple channels will be needed. One solution recommended by the Mitre Corporation and being carried out in Bloomington, Minnesota is to provide a limited single cable network linking together the schools.[10] This point-to-point educational network is in addition to the full community-wide dual cable system. The educational network would serve the expected high usage communications routes among schools. It would also be connected to the full cable system so that designated programs could be shared with the whole community. On the educational cable, electronic circulation of audio-visual materials would be triggered by a teacher in a classroom or student in a study carrel telephoning the central A-V library. There, personnel or student assistants would locate the tape (a significant number of color video cassettes is envisioned), put it on (or in) a deck, locate an empty channel, and inform the user of

the channel number.[11] Preliminary investigation has indicated that this projected use will be economically feasible within the next year or two for sizeable school systems.

Before ending this section on a bright note, it might be wise to look at one of the problems that could arise in implementing these ideas, namely, the direct costs to the schools. Presently, the internal wiring of school buildings costs $50-$135 per classroom.[12] Adding the cost of providing black and white or color receivers brings the estimates to $200-$300 or $400-$500 per classroom. Of course, if the sets are already available and if the conduit is already in (e.g., in new buildings), the costs of implementing cable TV would be reduced considerably.

While educational institutions may be forced to absorb the cost associated with the channels they request, this cost (not assuming the cost of cable, amplifiers, etc., and limited to the actual cost of activating and sending out a signal) may be no more than $1,000 per year, per channel.

Costs associated with playback VTR units and personnel to operate them are another consideration, though the aforementioned use of student personnel could provide the institution with cheap labor and the students with a relevant learning-living situation.

Perhaps the largest expense of all is that of programming. For example, production costs for the first year of "Sesame Street" were about eight million dollars. Anyone with previous experience in television production can affirm that the cost of producing effective programs is much greater than the hardware investment.

Where the needed extra money will come from is a question that may take some time to answer satisfactorily. Resource sharing on regional or larger scales would seem to play a major role in the eventual solution to this problem.

Two-Way Capabilities

As exciting as today's practical one-way and possible two-way cable applications are, the potential of the two-way capability of modern cable systems is even more far-reaching. The change from one-way television to a two-way information system marks a real break between the original community antenna concept and the newly emerging community information system. This quantum jump in communications potential occurs when information, in any form, is retrieved and exchanged upon demand.

Time-shared, remote access computers and networking have realized part of this potential for ticket reservations, corporate paperwork, the stock exchange, and even some public school uses (e.g., educational time-shared computer network). The telephone system has sufficed for audio and digital exchange up to a point. Common carrier microwave network and satellite systems are growing rapidly to help serve the need. But not many homes or even schools can afford private microwave or satellite ground station facilities, nor can the telephone system serve adequately as broadband needs grow. But cable has a potential bandwidth of 300,000,000 cycles per second, compared with the telephone voice channel's 5,000.[13]

This tremendous difference can greatly change the rules of the educational ball game. Remote retrieval becomes conceivable, two-way feedback a probability, and computer-assisted instruction a natural. With such far-reaching potential changes in store, it may help to return to the fundamentals and re-examine why the educational game was established in the first place. Though there may be disagreement as how best to verbalize the basic educational purposes, one thing should be clear: Two-way cable information systems have the potential to enable a direct concentration on and fulfillment of basic goals. This directness may by-pass traditional educational institutions and their secondary socializing, certifying functions.

> *Perhaps the greatest social benefit CATV could offer would be to serve as an* alternative *to the institutionalized education system. By removing the educators as gatekeepers, the cable complex of the future might become more responsive to the learning needs of individual users rather than the dictated requirements of certifying agencies.*
>
> *Not only could unemployed workers receive vocational training without the social stigma attached to attendance at special schools, and dropouts have a second chance at acquiring basic skills without returning to the institutions that had already branded them as failures, but minority groups could tune in to specialized programs not otherwise provided by the majority-oriented mass media. Physicians, lawyers, teachers, and other professionals could share information among their peers without having it packaged as graduate courses supervised by the local university. Unlike the finite broadcast spectrum, the cable has channels for all these purposes and more.*
>
> *One can imagine a complete pre-kindergarten through postgraduate alternative learning system based around CATV and other community social agencies.*[14]

The imagination need not extend itself uncomfortably in order to visualize several building blocks which already exist for constructing the alternative learning system: "Sesame Street" and "The Electric Company" on one end and the Minnesota Metropolitan State College or the Parkway School in Philadelphia on the other.

These new schools-without-walls are based on utilizing existing community resources of all kinds, not just social agencies. Having come so far in rethinking the resource end of education, it seems unlikely that such schools will have any trouble in recognizing the advantages of two-way cable communications over two-way car transportation for tapping resources. Whether the public schools can or will respond to this challenge in any significant degree is an unanswered question. In order to even partially answer it, it is necessary to slowly drift down to earth again after surveying the issue from a broad perspective.

To briefly review: The major advantage of cable's newly emerging two-way capability is in opening up a whole new world of an interactive media that can handle digital, audio, and visual information flow in both directions. This information exchange, storage, and retrieval system is fundamentally different from instructional television, no matter how well done. What is really involved is making available the advances of electronic communications technology to schools for the first time in an acceptable price range. Previously too expensive for anyone except large corporations, these communication tools are now becoming available for public service uses because of: Advancing technology, quantity production, and the economy of spreading expenses over a large population due to the interconnection of cable facilities. Thus, two-way capability might some day enable the home viewer to literally talk back to his set or to interact in other ways, such as using the set and attachments as a computer terminal, utilizing a light pen to respond to a light-sensitive CRT (cathode ray tube), or selecting any audio, visual, or printed material stored in a local, or perhaps national, library.

Before going into some more specific uses of the two-way capability, several notes of caution should be added. In the cold economic reality of today's cable television industry, there exists a considerable range of thinking as to how soon these "blue sky" potentials of two-way systems will become financial assets and not economic suicide. But the question is seldom "If?" but rather "When?" and "To what degree?" Educators may be able to exert significant influence toward answering these questions by exhibiting informed enthusiasm or unmitigated apathy. Apart from this influence, the municipal CATV ordinance and franchise can give legal force to the school's and the community's answer to "When?"

In order for the schools to know exactly *what* they want and *when* they can legitimately expect (or demand) to get it, more detailed investigation is required beyond the scope of this monograph.[15] Each school system, or joint powers grouping of school systems, must determine which of the two-way services practical today and in the near future would be most beneficial. Then action should be taken to insure that such services are made available. This could be done through the ordinance by requiring those specific services, though a special FCC waiver may be required. More general provisions, such as requiring system updating in line with the "state-of-the-art" in the cable industry, are discussed in Section III.

Even if the educator decides not to decide right away, steps must be taken to insure that present decisions do not inadvertently narrow those future decisions. For example, the layout of the cable system, if done without adequate consideration for future growth of two-way and switched services, may lock the community into a system that will require unnecessarily large sums of money to expand its capacity.[16] This added cost would ultimately have to be borne by the community users, such as the school system. And the more the schools have to pay for channels, the less they will have for using them.

The selection of the winning bidder is another critical process during which these same questions should be raised. It should be recognized that cable companies are presently concentrating on securing more franchises, rather than fully developing two-way uses. This is the result of a business decision that it is more important to get as many franchises as possible now (with the top 100 markets just opening up) and develop two-way later after the rush for these contracts is over. There are several dangers for education if this market place mentality is allowed to dominate the course of events. One is that insufficient attention will be given to the franchising process by municipal officials because of strong pressure from cable companies. While most of the damage could probably be rectified later by a determined effort, the cost would be much greater.

The potential danger least likely to be corrected is the saddling of a community with a mediocre cable company. Insufficient planning, low quality hardware, insensitive personnel and numerous other pitfalls await

the community which gives little attention to selecting the winning bidder. While such a company is more likely to sell out, probably to a better company, refurbishing a cable system and improving poor service costs money. That money must ultimately come from the community. The human cost of poor cooperation–with the resultant frustrated hopes and increased cynicism–is another burden that the schools, and the rest of the community, would have to bear. Appendix A contains some additional thoughts on the economic aspect of the school-franchisee relationship.

Interactive, two-way cable communications have so recently become reality that no solid evidence is available documenting their economic impact. Nevertheless, interactive units are now commercially available for home or school. A wide range of models with numerous optional attachments provide enough flexibility to serve nearly any need, though not yet many pocketbooks. Also, many "bugs" still exist in this equipment and two-way complications are still being discovered.

One variety of the basic unit consists of: A channel converter, allowing additional channel capacity; a hand set which is a coder-decoder, allowing channel sharing, and a 12-button keyboard, allowing digital response; a microphone, allowing audio response; and a simple frame-grabber, which allows still images to be stored and shown on the television screen.[17] Expansion of this basic configuration might include:

1. Higher capacity frame-grabbers[18]
   (a) one-page capacity of alphanumeric data
   (b) one picture
   (c) series of pictures
2. Teletype keyboard enabling varied responses including computer assisted instruction
3. Television camera
4. Light-sensitive cathode ray tube (CRT)
5. Printout attachment for hard copy facsimile reproductions
6. Paper tape recorder for an in-home record of responses
7. Credit card reader.

The educational uses of this range of electronic communications equipment are virtually unlimited. Completely individualized instruction is possible, since the student can choose over a wide range of options–from highly structured programs such as computer-assisted instruction to random browsing through material in the central data bank. Combinations of uses can take full advantage of this cybernetic system, while allowing the teacher to concentrate on teaching.

Computer-assisted instruction is being tested over the Reston, Virginia cable system, using touch-tone telephones for the in-home terminals. In the Orlando, Florida area, a computer is "on line" over the cable system and, perhaps a first, without subsidy for several hundred homes. Cable's great capacity means it is a better delivery system than the telephone lines; and several computer-assisted instruction packages (pre-tested) are becoming widely available. This may be one of the first two-way educational uses to find a home cheaply through the cable.

If group usage is desired, audio and even visual contact could be maintained, as well as sharing of data held by one of the group or by a computer. Since interscholastic sharing is also possible, another level of interaction and two-way feedback becomes possible. Incidentally, central computer facilities can be time-shared by different communities if their cable systems are interconnected. The variety of uses is limited primarily by the software or programming costs, not by the cable system itself or the central computer facilities. Because of this, interconnection is essential in order to share the cost of programming over enough school systems so that a large number of programmed learning choices are available without exerting a major financial drain on any single cable or school system.[19]

It must be emphasized that the two-way systems outlined above exist mainly as pilot projects in 1973. They are discussed to show that these uses are technically possible today and will be financially feasible in the near future, almost certainly within the lifetime of the cable franchise being awarded. It is therefore important to take these developments into account when deciding on education's involvement in today's cable television franchising process. Without sufficient attention to long-range development of communicating systems and the fundamental purposes of education, it is unlikely that enough re-thinking will occur. And without a fresh look, most of cable's potential for education will be lost. True, "wolf" or "salvation" has been proclaimed too often for educators not to be justifiably leery of extreme claims. However, cable communications, with its enormous capacity for carrying information upon demand in either direction, must not be under-estimated. Cable raises issues of social philosophy which need to be recognized and resolved. Of course, the resolution of questions like, "How can cable's beneficial social impact be maximized?" will require years to answer. Cable should not, and probably could not, be stopped from developing until answers to questions like this are found. But educators need to share in the search for wise system design guidelines.[20] Otherwise they must accept partial responsibility if cable's development

is determined by those who talk the fastest rather than those who offer the wisest comprehensive plan.

Hands On

Fortunately, technological developments have advanced to the point where two-way systems now function in a variety of settings. For example, a full two-way "community information system" is operating at Jonathan, Minnesota, a new town being constructed 25 miles southwest of Minneapolis. In early 1972, Community Information Systems, Inc. opened a room for public use in the Village One Center where working models of "respondors" are accessible to anyone who wants to try out the equipment and its two-way services. Participants then fill out a questionnaire about their use of the services.[21]

This project, funded through a Department of Housing and Urban Development grant and divided into three 12 to 18 month phases, has as its prime goal the determination of what people want and will use in a two-way information system. Phase I, begun in the fall of 1971, is the definition phase, making available a wide range of services to a few points in order to generally determine the community response. Community feedback will be sought covering four major facets: Technical, political, economic, and socio-cultural. The initial services will include: Two-way education uses, merchandising, polling, security systems, entertainment, and information retrieval.

Phase II, the "shakedown" stage, will involve the placement of 25 to 100 units in homes, schools and offices. Through day-to-day use in a natural environment, a clearer picture of the real life applications of this advanced system should emerge. With the findings from Phase II, Phase III will move into the "operation" itself with 1,000 to 2,000 units in a number of settings. By this time the feedback mechanisms should be sensitive enough to provide accurate information on the use patterns of a broadband communications network.

Other demonstration-sized, two-way systems are operating at Reston, Virginia (another new town, just south of Washington) and Overland Park, Kansas. The Overland Park system is using digital, audio, and visual return capability to bring educational services to a few home-bound students. Incidentally, it seems that using interactive television there has resulted in the creation of a psychological peer group for those home-bound students. The sense of isolation that previously retarded learning seems to be significantly reduced.[22]

Several full-sized systems are now offering two-way services. For example, in San Diego, California, Mission Cable has a pay cable channel in operation. In Orlando, Florida, computer terminals are now going into subscribers' homes.

Local Origination and Public Access

Another important aspect of cable television which is full of potential for the whole community is local programming. At first, CATV systems did not engage in any local origination. Gradually, the weather scan showing time, temperature, barometer, wind direction and velocity, and a forecast or community announcement came into common use. In a great many cable systems, that is still the only local origination. According to the 1,300 systems which responded (out of 2,500 operating) to a 1971 questionnaire from the National Cable Television Association, 780 provide automated origination; 422 are capable of film, taped, or live origination; and 284 systems cablecast on a regular basis an average of 16 hours per week.[23] Presently, most nonautomated local origination consists of old movies, local sports, panel discussions, bingo, and the like.

The potential of local production in cable television depends partially upon abundant channels (which allow for specialized audience programming for very small numbers of people) and partially upon technical requirements (which allow the use of television cameras and recorders costing a small fraction of the equipment needed for broadcast television). Another significant savings with cable is the elimination of an expensive transmitter for each channel.

The cost reduction is especially marked when half-inch video tape equipment is involved, such as that already owned by most school systems. For example, instead of paying $100,000 for a camera, $1,000 is more than adequate, and cameras costing only several hundred dollars are becoming available. A production facility for access channel users which concentrates on black and white portable half-inch video equipment might run in the neighborhood of $11,000 (2 portapaks, 1 studio camera, two studio VTR's, and attendant supporting equipment) or $3,600/year.[24] The attendant annual operating costs would run roughly $2,500, with a grand total for access center expenses running to $25,000.

Such a community video access center might be most easily funded through a combination arrangement with the community contributing space and volunteers, the cable company supporting equipment costs ($600) and one staff person (1 young idealist @ $6,000/yr.), with

revenues coming from minimal equipment charges and receipts from a "Playback Playhouse" ($2,400). If a population of 85,000 is assumed and a penetration of 40% after 10 years, a 5% increase in penetration would eliminate the operator's costs. Even without any additional subscribers, the cost to the cable operator is only 1-2/3% of his gross receipts. Assuming different degrees of complexity in the finished videotape, the weekly product could be approximately 7½ hours of finished tape or 370 hours/year.

It is no wonder that the Federal Communications Commission has encouraged the use of half-inch video equipment for cable systems:

> *We note specifically that the use of half-inch video tape is a growing and hopeful indication that low cost video tape recording equipment can and will be made available to the public. While such equipment does not now meet our technical standards for broadcasting, the prospects for its improvement and refinement are excellent. Further, since it provides an inexpensive means of program production, we see no reason why its development should not be encouraged for use on cable channels.*[25]

Along with this decrease in cost is a corresponding reduction in the complexity of operation. The simplicity of a portable half-inch recorder and camera is comparable to that of an 8 mm film camera. Because of this simplicity, production can be decentralized: Numbers of people can quickly develop sufficient skill to produce viewable video tapes. For educators, this means that students (high school, junior high, and elementary) can all be directly involved in production. Many projects around the country have established this not only as a possibility, but as a desirable and achievable goal. It has been said that for children to be raised on television and not be able to produce television is like being able to read without being able to write.

The opportunity for children to make video tapes using half-inch equipment has been available for several years. However, it is only with the coming of cable television that they will have a chance to show their tapes on a community-wide distribution system.

Federal Communications Commission

Why did it take so long for cable to enter the metropolitan areas? Broadcasters' resistance to the audience fragmentation that comes with cable's increased channel capacity is one of the primary causes. The Federal Communications Commission (FCC) had formerly required that the local broadcast TV station's permission must be forthcoming before any distant signals could be brought into a metropolitan area. Since that permission was not granted in any of the 100 largest metropolitan areas, cable television had been virtually frozen out of these markets. In a few instances skyscrapers, hills, local origination, and careful management provided an environment in which cable television could survive even without importing any distant signals.

But, generally, in metropolitan areas, cable television was not considered a good situation for risk capital investment. What has changed this is the FCC's gradual change of heart regarding CATV. In August, 1971, the FCC announced its intention to allow a few distant signals into the top 100 markets. Then in February, 1972, the FCC released its full Report and Order which permits metropolitan areas to carry distant broadcast signals through cable television systems.

The Report and Order also touches on many other areas of cable regulation, making it an essential document for educators involved in cable (consult the bibliography for its source). These regulations became effective March 31, 1972. Briefly, the main provisions are as follows for the top 100 markets (with Report and Order page numbers parenthetical):[26]

1. Establishment of a formula which allows importation of distant signals
2. Requirement of a minimum 20 channel capacity "available for immediate or potential use for the totality of services to be offered" (p. 3289)
3. Suggestion of a 15-year franchise length but requiring only that "the initial franchise period and any renewal period shall be of reasonable duration" (p. 3281)
4. Requirement of at least one channel for free public access on a first come, non-discriminatory basis. Furthermore, "the system shall maintain and have available for public use at least the minimal equipment and facilities necessary for the production of programming for such a channel" (p. 3289)
5. Requirement of at least one channel each for use by education and local government free for the first five years (pp. 3270, 3289)
6. Establishment of a formula to require access channel capacity expansion according to demand (p. 3289)
7. Requirement that in live use of the public access channel for five minutes or less, the production cost be borne by the cable system owner (p. 3289)

8. Requirement of two-way "technical capacity for nonvoice return communications" (i.e., narrow band) (p. 3289)
9. Establishment of technical standards (pp. 3290-92)
10. Requirement of a construction timetable to "equitably and reasonably extend energized trunk cable to a substantial percentage of its franchise area each year," suggested percentage being 20% (p. 3281, 3276)
11. Limitation of municipal franchise fee to 3% of gross subscriber revenue, or in special cases 5% (p. 3281)
12. Requirement on franchising, saying that "the franchisee's legal, character, financial, technical, and other qualifications, and the adequacy and feasibility of its construction arrangements, have been approved by the franchising authority as part of a full public proceeding affording due process" (p. 3281) and expecting that "authorities will publicly invite applications" (p. 3276)
13. Requirement of nonbroadcast bandwidth equal to that of broadcast, plus making available unused nonbroadcast bandwidth for leased access channels (p. 3289).

If there is one thing to be learned from the history of cable television and the FCC, it is that there is much uncertainty still in store. For example, the November, 1971 compromise between the cable and broadcast industries changed the August, 1971 "Letter of Intent" outline to limit the choice of distant signals which a cable system could carry. The compromise also allows broadcasters in the top 50 markets exclusive rights to programs, a tool that might slow down cable growth in those markets. Also, the FCC issued a Reconsideration of Report and Order: (*Federal Register*, July 14, 1972, Vol. 37, No. 136, Part II) which, while essentially defending the Report and Order, did make a few changes, such as making the 15-year franchise-length maximum definite.

Nonetheless, as CATV becomes CIS (cable information systems), it will likely be viewed less as a luxury and more as a near necessity. Certainly, CIS can offer the prospect of a nearly unlimited entertainment and cultural diet ready upon request. Of more significance, however, is the storehouse of information CIS makes available to the millions of people who need accurate information for daily decisions. Because CIS makes computer technology available in a simplified fashion at a low cost, it will probably have more effect on work habits than on play. The low cost of an advanced CIS can be seen by comparing its approximate cost to that of the telephone system, both of which are roughly $500 per unit.[27] It seems probable that people will become more dependent on CIS than they are on the telephone, as they are forced to use its sophisticated services to solve complex social problems. The flow of information in our society is rapidly becoming as important as the flow of money.[28] Information is being recognized as power in more and more ways. For this reason the emerging CIS will have vast ramifications in many areas, especially education.

II. INVOLVEMENT: WHAT TO DO

Before listing some specific tasks awaiting the conscientious educator, it is important to understand the forces operating on cable's development. One of the strongest of these is the cable entrepreneur. Irving Kahn, former president of TelePrompTer, was more honest than most who speak from this perspective when he said, "In dealing with any city, you have to go to the guys who know the guys. We're in 88 towns, and we have 88 lawfirms, all politically connected."[29] Anyone reviewing their local cable scene finds a landscape similar to that described by Mr. Kahn, regardless of the company.

Large national multiple-system-operators (MSO's) like to have at least one solid, local front. Meanwhile the independent and/or locally-owned applicant feels that he should emphasize his strength and consequently also builds as strong a local flavor as seems helpful. This sometimes leads to situations where political ties are extremely blatant, such as one suburb where the company was represented by the village's attorney. With state senators and representatives, former (and occasionally present) council members, local business and institutional leaders all being involved, they are often in competition with each other. It is not unusual to find a local state senator, a businessman with ties to council members, the newspaper editor and even a public school administrator, vying against one another on behalf of their respective companies for a cable franchise.

Political influence is not the only undesirable characteristic to beware of in municipal franchising. The Center for the Study of Public Issues at Princeton, New Jersey, surveyed franchising in that state and found that haste, lack of competition, no-show franchises and pressure on small towns were all common occurrences in municipal franchising. Often a city or town literally gave away its franchise to the first company to come along after only one or two council meetings. The Princeton Study found that in a significant number of cases the cable company would not build a system after obtaining the franchise. Rather, the company would attempt to sell it or hold it for speculative purposes–instances of "no-show" franchises.

After several franchises have been awarded in an area to one cable company, it will often approach an adjoining smaller or less densely-populated municipality and strongly suggest that it grant its franchise to the same company. "After all," goes the reasoning, "you're not going to get anyone else to come in here and build anyway, now that we have." This "pressure on small towns" tactic noted by the Princeton Study is another pitfall to be avoided. Yet some of the most damaging elements of this poor record appear to be built in (i.e. political influence). As the Princeton report said, "It would be naive to expect anything else to be the case, given the structure and nature of local government in New Jersey."[30] It is discomforting to note that this can be applied accurately to the other states as well.

Since this is the case, a few words need to be said about state level regulation, before focusing exclusively on the municipal franchising process. In what stands as probably the single most helpful work to date on state regulation, *State, Federal, and Local Regulation of Cable Television,* Stephen Barnett notes that though the municipal regulation scene is improving:

> *"The local government remains a one-shot, part-time participant in the franchising game. The franchising of cable systems will not recur with sufficient frequency–even if the franchise terms are cut down to reasonable size–to support development within the local government of continuing expertise in the cable field. The municipality thus cannot hope to do as well in the franchising process, operating alone, as a state agency whose broader jurisdiction would enable it to develop and maintain a permanent cable staff."*[31]

Barnett goes on to examine all the existing state regulatory patterns and then bring together his findings in the form of a recommended state involvement–a mixed municipal-state regulatory distribution. Another useful resource for educators attempting to comprehend state involvement is *Cable Communications in Wisconsin: Analysis of Proposed Recommendations, Document No. 3,* prepared by Lawrence W. Lichty.[32] Along with a thorough, wide-ranging list of possible recommendations, it includes much background material.

Educators should recognize that state involvement will be one of the hottest areas of controversy in cable. It is imperative for the educator to carefully but decisively develop a position on the state's involvement in cable. Though the importance of the state question cannot be overemphasized, its complexity is such as to require passing over it because of space considerations.

Regional government is usually less popular than state government with municipal officials. Even so, it soon will be recognized that regional problems exist, especially in an urban area which can be managed only

at a regional or broader level.[33]

Continuing to tighten the focus, joint powers agreements on an area-wide basis are another necessary consideration for the educator trying to sort out the levels and range of options. At each of these levels, decisions need to be made, not only about what, if any, regulatory power to invest in the government, but also about what degree of educational resource-sharing is best suited for particular institutions.

Coming to the municipal level, it is important to realize that commercial cable companies probably already have begun to cultivate contacts with local municipal officials. The official public franchising process may begin only after one of the companies has determined that it has adequate support on the city council to receive the franchise. Consequently, if educators wait until the municipality drafts its ordinance or advertises for bids, the minds of the council members may already be made up. That is why the following activities should begin immediately:

- The school system must do its homework and do it quickly and well.[34] It's essential to become informed about cable television, starting with the material in the bibliography of this report. After reviewing the possibilities for educational uses of cable television, the school administration should make some tentative decisions about the main thrusts of their use of the system. The school board should be kept informed of this process and, if appropriate, asked to ratify these decisions.

The school system might wish to draw up a preliminary position paper on cable television, endorsed by the school board, to send to the city council. Such a paper might stress the importance of taking adequate time to research and write a request for a proposal and an ordinance. The necessity of engaging competent assistance on the legal, technical, and social aspects of the ordinance should also be stressed.

A good municipal approach to franchising, and one that educators might suggest, is the ten-step Request for Proposal process outlined by the International City Management Association in its January, 1972, *Management Information Service* entitled "Drafting Municipal Franchises for Cable Television Systems" (consult the bibliography for address). Since this is as close to a model procedure as can be found in print, and considering its source, it may be wise to get extra copies and distribute them to appropriate municipal officials. Or, since as educators we know the motivational value of participation, the officials might be asked to obtain the copies themselves.

Before applying the ten-step Request for Proposal (RFP) process, it may be wise to pause and consider the possibilities of developing some type of experimental project in your area, probably involving federal or foundation money. Is there interest in whether a zero subscription rate system might work by drawing solely on leased channel fees and other services provided? What about a special application pooling the resources of the colleges and libraries in the area? Whatever the situation, don't be too hasty in plunging into the fray. You're only virgin cable territory once; enjoy it.

And now for the shortened ten-step:

1. Standard Provisions. Develop a set of standard provisions that you will expect any operator to meet. This will include such items as: statement about what is being granted; nonexclusive franchise; requirement for law compliance; no waiver; liability; street repairs; performance bond, etc.
2. Draw up an initial draft of bid variables. This is a listing of the criteria that will be used, and how various areas will be weighted (for example, to favor the bidder with the lowest rates or most free access facilities).
3. Detail the supplementary information desired of the applicants, e.g., financial information; locations of other franchises; service quality; construction plan; access channels plan.
4. Circulate the draft containing 1, 2, and 3. This is the time for maximum public participation and redrafting and more redrafting and public hearings and more public hearings.
5. Distribute the Request for Proposals (RFP) widely. Use the trade magazines and organizations, plus any non-commercial circle that might be interested. Give official local notice in the paper.
6. Call a bidder's conference to clarify the RFP.
7. State a conditional closing date, if you have more than 5 bids.
8. Begin the review process, with more public participation, this time perhaps formalized into a citizen's or educational committee.
9. Hold public hearings on the merits (and demerits) of the applicants. Narrow the field perhaps.
10. Make a decision, and state why.

Throughout the whole process, maximum public participation should be encouraged–specifically other public institutions and citizen groups. A loose coalition with these groups might emerge, focused on maximizing the quality of the cable ordinance. The city council might be asked to appoint a citizens advisory commission on cable to handle the large amount of research needed for writing a good ordinance and wisely selecting a franchise. The school system should keep in

regular, informal contact with the city council and officials. The best materials educators come across should be passed on to them in an easily digestible form. The job of writing a good request for proposal and ordinance should be made as easy as possible for municipal officials. A detailed study on the specific ordinance provisions (and their weighting) that the school will request should be begun.

- As the writing of the cable ordinance nears, a well-documented presentation to the school board should be prepared, covering the provisions needed to protect and facilitate education use of the cable system and the services desired of the franchisee. Obtaining board approval of this position paper and of an official school representative to the city council on cable is also important. Board members, school employees, and friends should be encouraged to educate themselves on cable and to spread cable information throughout the community, always making sure that city officials are fully informed.
- With the new FCC rules setting minimum and, in some areas, maximum standards for the municipal cable ordinance, many of the benefits educators may wish from cable can no longer be required through ordinance provisions. However, educators can accomplish much the same end through the RFP process. Educators should ask the city to include in the RFP a clause requiring bidder response to the school's position paper. Or perhaps the schools might wish to send copies of the position paper directly to the bidders in time for them to incorporate their responses in their official franchise applications. In either case, meetings with the cable companies, the municipal officials and the municipal cable consultant will probably be helpful in clarifying the position of educators and in establishing rapport.
- Once the school community is informed and united on cable television and the drafting of the ordinance continues into the crucial stage, the school's cable representative should be as involved as possible. Direct personal contact with councilmen is important in order to fully explain the many educational aspects of cable. It is also important to be in contact with the city manager and attorney, since they will probably be the ones to do the actual drafting of the ordinance. If the school system has investigated the possibility and decided to apply for the franchise itself, in order to invest the profits from the system in providing better educational services for the community, more educational work than before will be required. Or, since municipal ownership is an alternative, perhaps that option should be made more widely known.[35] Whatever course is decided on, persistence is needed.
- In the midst of building support for the school's RFP and ordinance provisions, as many of the local citizenry as possible should be involved in the franchsing process, regardless of whether or not they specifically support the school system's position. Increased involvement cannot help but improve the general quality of the ordinance and the bids. Educators might help cable get good local press coverage and speak frequently about it to local civic groups. This will probably be the most important decision that the council will make for many years. Consequently, the process of writing and revising the ordinance should take about a year, with selection of the winning franchise requiring a comparable period. If various forms of nonprofit ownership are considered, as they should be, two years is a reasonable length of time to complete all the detailed investigation to make a decision.
- Direct contact should be made with all franchise applicants in order to insure that they understand the school's position and its commitment to following through and utilizing the channels, studio facilities, or whatever else constitutes the school's requested ordinance provisions. It is easier to discuss the intricacies of an ordinance in settings less formal than an official public hearing. All applicants will be willing to work with the schools to some degree. An important indication of that degree can be determined by their reaction to putting their promises to the school and city in solid legal language in the ordinance. The assistance of the school attorney will almost certainly be required in this process. Section III contains suggestions on ordinance provisions that should be considered.

However, the most important discovery to make in discussions with franchise applicants is their basic feeling about education: Do they view education as a parasite—or as an unlimited source of programming? Or do their feelings fall somewhere between these two extremes? The essentially cooperative nature of the school's and cable company's activities should not be underestimated. The better the job that one does, the more the other will benefit. Appendix A has a more thorough discussion of this point.

- Once a draft of the ordinance is prepared for discussion, copies should be sent to the National Education Association, the Cable Television Information Center, the National Council of Churches Cable Advisory Service, and any other group from whom informed feedback could be expected. Their addresses are noted in the Annotated Bibliography.

III. FRANCHISE PROVISIONS

Background

This chapter is divided into three parts. This first section cites some views of the municipal franchising process and its results. The second section is a list of essentially educational provisions that the school system should consider recommending to the city council for inclusion in the cable ordinance. The third section is a list of general franchise provisions that have an indirect bearing on education and are generally important in upgrading the quality of the franchise. Both lists are stripped of all legal terminology and thus would require rewording by an attorney before being included in an ordinance. More detailed information on these provisions should be obtained before advocating their inclusion, so as to have at hand adequate supporting evidence. Neither list is, in any way, inclusive. Both are presented primarily to stimulate thoughtful consideration of some of the more common educational provisions.

The franchising process is filled with problems, according to observations of Monroe Price, UCLA Law School professor and noted cable authority:

> *Municipal regulation is the closest thing to no regulation so far as affirmative obligations are concerned. Municipalities do not have the expertise to fashion policy for the spread and regulation of the coaxial cable which is in the national interest. Even if they work diligently to produce the best possible agreement there is usually no enforcement machinery.*[36]

The findings of Stephen R. Barnett, University of California, Berkeley, law professor specializing in communications law, support the above observation:

> *That municipalities under the present system are likely to have done a careless and unenlightened job of choosing their existing franchises and bargaining for the elements of the franchise would not matter, of course, if there were not a significant public interest at stake in those decisions. But there assuredly is. Issues such as the area to be served by the system; the speed of its construction; the number of channels; the availability of channels for municipal, school, and public use; the provision of community origination centers and filtration devices; the quality of the service to be provided; rates for subscriber service; rates and terms for access to the "public channels" and the leased channels; provision for two-way capability; interconnection with other systems; franchise fees; the term of the franchise–these go to the heart of the public's interest in the communications revolution that cable television represents.*[37]

Other studies of the franchising process reveal similar conclusions: Expertise and experience are severely lacking at the municipal level, and franchising recurs so seldom that development of these qualities seems unlikely. Furthermore:

> *After the franchise is granted, the regulatory capability of the municipality is even further diminished. Having lost its bargaining power, the municipality must now rely on ongoing regulation to assure that the franchisee performs in accordance with the franchise (and ordinance) terms and the public interest–not to mention effecting changes in the franchise that may become desirable. The resources, personnel, and expertise required to do the job effectively may be beyond the capability of even the largest cities; they are surely too much to expect of the middle-sized and smaller ones.*[38]

In the midst of all this municipal activity, other levels can't be forgotten. Such levels may well be necessary to solve regional overlap problems. In many metropolitan cases, school district and municipal boundaries are not identical. Thus many school systems will be forced to deal with two or more municipalities, assuming that no joint power agreements are made regarding cable television. Such agreements, however, make sense, especially for grouping small municipalities. A joint powers approach could make the latest technology available more quickly, encourage cooperation on mutual problems, permit the cost-sharing necessary for effective municipal-level regulation, and perhaps reduce subscription costs through sharing of common electronic equipment (while retaining decentralization of production facilities).

Central Educational Provisions To Be Considered

Note: *Because most of the following provisions exceed FCC regulation, a case must be made for exceptions. The franchisee's support also is necessary, since he is the one who must "plead his case" in his FCC certificate of compliance proceedings. Thus it may be wiser to elicitate voluntary inclusion of these positions on the proposals through the RFP process, rather than risk illegally requiring them in the municipal ordinance. Since the*

proposal of the winning bidder becomes part of the ordinance, it has the same force of law.

1. Free hook-up and ongoing subscription to the cable system for public institutions is now a standard provision in almost all ordinances. A clause should also be included covering any future expansion of these institutions, plus a school option to have the hook-up done in a manner chosen by the school.

2. Reservation of additional channel capacity for educational use, provided that a specific plan has been developed requiring special exemption from the FCC's formula should be considered. For example, the six months allowed the franchisee before adding channels based on need may preclude cable's use as an audio-visual distribution network in large school systems in the multi-channel needs.

3. "At cost" internal wiring of public buildings should be considered. Though the need may not now be recognized, the school system will probably want all rooms in all buildings wired within the life of the franchise being negotiated. In provisions such as this, which may involve considerable financial expenditure by the cable franchisee, it may be wise to include a time-delay clause because of heavy early costs.

4. Interconnection with those neighboring municipalities with which the school system shares school districts should be included. This interconnection requirement should state that a certain quality signal be delivered to the municipal boundaries, with responsibility for determination of satisfactory interconnection left to the school system or city council. Interconnection with all metropolitan area municipalities is also needed, with the city retaining the authority to direct the franchisee to adopt the interconnection system of the city's choice. This degree of interconnection is essential for many two-way uses because of the need for cost-sharing of central facilities and programs.

5. Production arrangements suitable to the school's needs should be included. This might include the franchisee giving the school some production equipment, joint ownership of a studio, or company ownership with *x* hours of school use permitted per week, including all facilities and support personnel at not cost, or some combination of the above.

6. Two-way, broadband return capability should be specified, with that capability to be actualized at the request of the schools or city council.

7. The area should be wired in such a way that it can be sub-divided into smaller and smaller sections as the two-way use requires, thus multiplying channel capacity. With this system design, for example, a 40 channel system of ten sections in a municipality could have a potential of 400 different channels. Since the school system provides a natural network with the approximate density needed, the centering of section sub-hubs on elementary schools might be encouraged.

8. A regulatory body with independent professional assistance should be established to monitor the actions of the cable company on a continuing basis and insure compliance with the law. Ordinance provisions are of no use unless enforcement machinery is established and adequate penalty provisions are written into the ordinance.

9. A common carrier situation should be established on all non-broadcast channels by local ordinance in addition to the FCC's regulation to prevent franchisee interference with educational use. The other FCC regulations should also be duplicated in the municipal ordinance to insure enforcement.

10. The cable system should provide for interconnection with any computer time-sharing, ITFS (Instructional Television Fixed Services, 2500 MHz microwave), or any other local educational communication systems used by the school districts.

11. A percentage of the subscriber revenue receipts might be requested, perhaps two percent, for public or educational cablecasting purposes. Making this request obviously commits the school to sustained, significant production involvement.

12. Public, nonprofit, and local ownership are factors that tend to make a cable system more responsive to community pressure and more likely to recycle profits into system updating or subscriber rate reduction.

Secondary Educational Provisions To Be Considered

1. An updating requirement to keep the franchisee in line with the latest "state-of-the-art" developments and to prevent system obsolescence should be considered. This provision should be worded so that determination of adequate technological advance is retained by the city council. More generally the city should reserve the right to amend the ordinance at any time in order to require additional or higher standards in the construction, operation, maintenance and expansion of the cable system.

2. Interconnection with all municipalities in the metropolitan area is important for two reasons: (a) expensive centralized computer and library facilities

require economics of scale that can result only from interconnection; and (b) sharing program material across municipal boundaries is as important as sharing an interconnected telephone system. One may never use all the possible connections, but it is wise to have the potential. Political agreements on a metropolitan scale must be reached if an efficient low-cost interconnection system is to be developed.

3. A maximum 10-year original franchise period is advised by the Ford Foundation, RAND Corporation, Sloan Commission on Cable Communications, the Michigan Committee on the Future of Educational Telecommunications, and PubliCable, a coalition of 53 national organizations including the NEA and J.C.E.T. It is important to realize that the main purpose of renewal procedures is to provide for systematic review of the system's operation. Limited options for ordinance revision might also be required after five years.

4. Technical standards should be included; see *Schools and Cable Television* for details.

5. Forty channels should be required in all but the smallest communities. Dual cable should also be required, where feasible, to provide for easy, low-cost future growth.

6. Public access to studios, equipment, and production personnel must be established at no charge or for minimal fees. Without access to production facilities, public access channels are worthless.

7. The establishment of subscription rates should be done through the city council and they should retain the power to unilaterally adjust rates if the evidence so dictates. Fees for the non-standard channel converter should be included.

8. A provision might be included granting the city or school system an option to buy the system after a period of years. Or, in the event of a transfer of ownership, the city might retain a right of first refusal as well as a veto power over any ownership changes.

9. Any monitoring of the uses made of the cable communications system (e.g. channel selection) should be allowed only when written authorization is granted by those whose use is being recorded.

10. Local origination of material should be dealt with in the ordinance. This can be done by requiring *x* hours of true local origination material per week from the franchisee and by funding community nonprofit groups through a percentage of the gross operating receipts of the cable system.

11. AM, FM and shortwave radio carriage should be required, with the city retaining its right of specific requirements.

12. The franchise should be nonexclusive.

IV. ALTERNATIVE FORMS OF OWNERSHIP

Many options are available for cable ownership patterns. Municipal ownership is probably the most common of these other than commercial, with approximately 25 municipally owned systems in existence. It is important in municipal ownership and in the other possibilities that follow, that provision is made for would-be profits to be channeled back into the system, either in the form of improved services or lowered subscription rates. Judging from those systems on which information is available, the subscription rates of noncommercial systems are generally about half those of commercial systems. For example, the one municipally owned system in Minnesota, at Jackson, has a monthly subscription rate of $1.75, compared to the usual $4-$6 fees.

A citizen's Cable TV Study Committee appointed by the Detroit, Michigan Common Council recently recommended that the city create a special public authority to finance and construct its cable system. Its 162-page report, *Cable Television in Detroit: A Study in Urban Communications,* makes a case that public ownership is most likely to provide the highest level of public services. Financing for this public ownership would come from revenue bonds and would not involve taxpayers' money.

The Committee argues, based on its year-long study involving numerous independent consultants, that the key justification for public ownership is the opportunity to reinvest system revenues back into the cable system to support the public interest services. "It would be quite akin to a gift of public monies if the City were to negotiate for a system that might have significant profits yet fail to obtain for itself either appropriate financial returns or contribution of services to itself and its citizens."[39]

The Ford Foundation strongly recommends nonprofit ownership and suggests that a coalition of public institutions and community groups might be a preferable approach to the ownership question. Possible candidates for such an enterprise would include public television stations, universities, "libraries, service organizations, community action agencies, neighborhood associations, centers for the performing arts, PTA's, school systems, chambers of commerce, professional associations. . . ."[40] The Ford Foundation stated, in testimony before the FCC, "Free of the commercial imperative to invest in services that provide the quickest return on capital, the nonprofit owner should be more willing to experiment with new technology, to provide services of untested or marginal profitability, and to serve low income areas where potential subscriber interest may be less certain."[41]

Two other forms of ownership are the mutual company and the cooperative. In both cases, the systems would be subscriber-owned, probably with some form of elected board directing the activities of a fulltime professional staff. The central problem in this arrangement is that the front-end, or initial investment, costs are extremely high. This usually requires borrowing large sums of money and resultant interest costs. In borrowing the capital required to build a cable system, the nonprofit franchise holder must usually go to the same financiers that the commercial owners depend upon. And in that setting, it is usually difficult for the nonprofit applicant to show the same kind of "track record" proof based on experience that the profit-oriented franchisee can muster.

For this reason, a number of nonprofit groups are considering collaboration with commercial operators. These lease or joint venture arrangements hope to maximize community control over the system and the utilization of experienced managerial and financial resources. It is possible that an enlightened, active community could maintain approximately the same degree of community control over a wholly commercial system. One form suited for full community involvement is to completely separate the construction and maintenance of the physical plant from the programming and local production aspects. An elected cable board, analogous to a school board, could direct this public corporation. Commercial operators vary widely in their reaction to such propositions. Though response is generally negative, it is possible to find commercial interests open to this sort of arrangement, provided that it has full public support.

Ownership of cable TV by public school systems is another possibility. The University City, Kansas school district is reportedly considering such a plan. Also:

> *The Mineola, New York, school district is planning to build its own CATV system and supply each student's home with a response terminal. It's envisioned that pupils would eventually spend several hours a day participating in individualized instruction via the home terminal; they would come to school for group learning and social activities. Pilot tests are due to begin during this academic year.*[42]

Vincennes University in Indiana has been in the

community antenna business since 1964. The first public agency in the country to generate capital for a CATV system by floating bonds, the University has built and is operating systems in Washington and Vincennes, Indiana, and Lawrenceville and Bridgeport, Illinois. Progress as of April 1972: ". . . we are over the hump on the amortization of our bonds [two issues totaling $970,000] and the project is beginning to pay. It cleared some $75,000 in our community last year, which went into educational television."[43] While this use of system revenues for educational television does not strictly meet the prime justification for public ownership (i.e., reinvestment of revenues to support public interest cable services), it is a preferred alternative to private distribution of the money.

In the long run, it seems highly probable that competition will diminish in cable TV as it has in many other businesses. Indeed, the present rate of merger activity is such that a Big Three situation is evolving rapidly. Any unnatural barriers constructed against these monopolistic tendencies of ecological and economic systems should be recognized as such; competition is unstable and normally a temporary state.

It appears likely that a telephone-type arrangement will be the eventual outcome of cable activities, with only a few publicly-owned and independent systems remaining in existence. Under these circumstances, the key problems will be how to maintain a self-correcting, accountable bureaucracy. However, these long-range probabilities should not discourage anyone from presently engaging in much-needed experiments of alternative operations and ownership. If anything, the eventual centralization of cable ownership into a quasi-monopoly reinforces the need for experimentation now, before additional hardening of ownership patterns occurs.

V. EDUCATION, CABLE COMMUNICATIONS AND EVOLUTION: THE LOG FORMAT AND BEYOND

Long ago, education began using the proverbial two-people-on-a-log format. The log format requires 1) a suitable log; 2) the right people; 3) their being on the same log. Passing by number one for the time being, let's assume that the number two problem remains basically unchanged. Certain teacher-student pairs "click" and others "flop." The difference is more than good public relations, good theater, or even good teaching. A significant factor is plain old "personality." And that's something you can't do much about, right?

Wrong. Enter number three. Instead of changing the personalities, perhaps we should increase our supply (and thus our range) of personalities. The basic problem is not how to change personalities, but how to get the right personalities together. As long as that meant *transportation* to the same log, it meant too much money to worry about the right pair. However, once the ends of the log can be separated and the number of possible combinations for log-formatting increases drastically, the probability of a student finding a teacher who turns her/him on also increases drastically. And it increases in spite of the absence of physical face-to-face contact. Metaphysical face-to-face contact over a videophone with someone who excites you is more stimulating than physical face-to-face contact with someone who doesn't. One-way face-to-mind may be even more stimulating. A videotape of Margaret Mead expounding on the human condition may very well be an improvement over Mr. Fritz lecturing, as far as turn-on value goes. However, Mr. Fritz may be able to direct the student to the section of Ms. Mead's writings pertinent to the student's interest, something that Ms. Mead is not able to do personally.

One of Margaret Mead's friends is Constantine Doxiades, master planner and coiner of the word "ekistics" or the science of human settlements.[44] Doxiades defines the five elements of ekistics as: man, nature, society, shells and networks. Let us concentrate on networks:

> *The complex social and economic activities of a modern society are organized, developed and supported by three major networks: the transportation network, the power network and the communication network. The flow of passengers and freight, the flow of energy in the form of electricity and the flow of information provided by these networks combine the actions of individuals in diverse locations into an integrated whole. The communication network is probably the most vital. It clearly plays an indispensable role in almost all aspects of social and economic activity, including the regulation of the transportation and power networks.*[45]

Communications networks have changed greatly over the past few millenia, in a manner more revolutionary than evolutionary. To mark the jumps, or system breaks, in the development of communications, four distinctive revolutions could be cited:[46]

1. the invention of speech,
2. the invention of writing,
3. the invention of the movable-type printing press,
4. the invention of two-way, global telecommunications system, with individualized remote access.

Each communications revolution has precipitated a thorough and fundamental change in the way that information is circulated and stored. As a consequence the society is fundamentally altered, especially in its ability to recognize a problem, mobilize resources to solve it, apply a solution, and get accurate feedback soon enough to assure helpful intervention. William Thompson describes this situation creatively in *At the Edge of History:*

> *An environment is a field of energy that supports the individual organism; information is the individual's means of storing energy and thereby controlling his relationship with the environment. Since information is a control of energy, a society is only as large as its capacity to store information. . . . Tribal man's memory is prodigious, but the amount of information an urban society can control is thousands of times greater.*[47]

Society is only as large as its capacity to store information; there is a direct relationship between this kind of size and problem-solving capability. As one computer advertisement says: "No one can take the ultimate weight of decision-making off your shoulders. But the more you know about how things really are, the lighter the burden will be." Given projections such as The Club of Rome report, *The Limits to Growth,* it is clear that the very survival of the human species is in the balance.

Unlimited physical growth is obviously not possible when the supporting resources/systems are limited.[48] However, unlimited metaphysical growth is possible, if it doesn't consume raw materials in the traditional

industrial fashion. One of the greatest advantages of the current communications revolution is that it provides a means to the knowledge economy (see fn. 28) in which growth is no longer synonymous with consumption of natural resources. Rather the flow and processing of information become the dominant pattern in the economy, replacing the flow of goods. Consequently, it is possible to squeeze between the horns of the continuous growth (cancer)/no growth (death) economic dilemma.

The enormous complex problems facing our society today require that its problem-solving ability be equally enormous and complex, while remaining sensitive. This challenge, if it is to be met, demands a communications network with characteristics which as yet have not been put together. To examine what characteristics might be involved, it may be beneficial to first focus on the needed capacity of the communications system. To avoid becoming needlessly specific, it might merely be stated that the capacity be enough to satisfy the needs of a planetary population in the billions on an individualized basis. Decentralization to the individual level seems necessary to allow each person to fully develop through the appropriate personalized information diet. Two-way capability is thus essential in order that the individual may have full control over the diet and that forced-feeding may be minimized. Individualized broadband return capability is perhaps not economically feasible in the near future. Nonetheless it is important to determine now if such is a desirable trend. It seems clear that such is the case, while an equally clear realization is the need for simplicity, without which technocratic rule may well prevail.

Another essential factor is that the flexibility of the communications system be sensitive to the unique needs of each of the billions. This obviously requires an information storage and retrieval network plus switching capabilities comparable to those achieved by the telephone system, encompassing the whole planet. To top this all off, the whole thing must not be beyond the available financial means.

To summarize, the characteristics of the communications system are: A global ultra-high capacity, maximally decentralized, simple and adaptable, with a minimum of cost.

Broadcast television, with its one-way mass-oriented technology, cannot fill these needs. Neither is print suitable as the prime communications system. It is quite apparent that cable information systems are as close to the ultimate communications network as need be.

How can these communications needs be applied specifically to education? It might be wise to look at some characteristics which describe ideal educational systems, and then see how these ideas can be fulfilled.

Three characteristics suitable for at least a beginning are expressed by Ivan Illich as:

> *–It should provide all who want to learn with access to available resources at any time in their lives;*
>
> *–empower all who want to share what they know to find those who want to learn it from them;*
>
> *–and finally, furnish all who want to present an issue to the public with the opportunity to make their challenge known.*[49]

In summarizing these purposes, Illich goes on to say, "It should use modern technology to make free speech, free assembly, and a free press truly universal and, therefore, fully educational."[50]

Moving on to the application of these ideas, Illich discusses four "learning webs":

> *. . . four different approaches which enable the student to gain access to any educational resource which may help him to define and achieve his own goals:*
>
> 1. *Reference Services to Educational Objects–which facilitate access to things or processes used for formal learning. . . .*
> 2. *Skill Exchanges–which permit persons to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills, and the addresses (telephone or terminal numbers?) at which they can be reached.*
> 3. *Peer-Matching–a communications network which permits persons to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry.*
> 4. *Reference Services to Educators-at-Large–who can be listed in a directory giving the addresses and self-descriptions of professionals, para-professionals, and free-lancers, along with conditions of access to their services.*[51]

No attempt will be made here to summarize Illich's explanations of these "learning webs." The reader may go directly to pages 113-150 of *Deschooling Society*. Furthermore, no attempt will be made to belabor what by now is an obvious point, the relationship of CIS and these networks. It is easy to find confirmations of how eminently suited cable information systems are for learning web service. And it seems apparent that CIS is

the means to other learning systems as well, because of its ability to reach literally billions–but on an individualized basis.

The author hopes that persons with information to share will contact him through the ERIC Clearinghouse.

Appendix A

"THE FREE CHEESE OF MOUSETRAPS"

Twice in the past few months this author has talked with prominent individuals, one in education, the other in cable, who seemed to lack understanding of the school-cable company relationship. In the first incident, the educator took exception to the use of the word "free" in describing some of the educational provisions that might be considered for inclusion in ordinances and franchises. "The only free cheese comes in mousetraps," was his thesis. Anything you get "free" from one hand you can expect to have taken away in another form by the other. The cable operator in question expressed a similar view on the topic of interconnection, "The schools do not expect free electricity from the power companies. Why should they expect free interconnection from the cable companies? Let them use ITFS. That's what it's there for."

Both of these conversations point up a basic question about working relationships that may develop between schools and cable companies. Is the relationship essentially a competitive situation, where what the school system "wins" in the form of ordinance provisions is "lost" in some financial form by the cable system? Or, on the other hand, is the school-company relationship more accurately viewed as basically cooperative, and mutually beneficial? Holding this latter view, the author would like to advance his understanding of this central issue in the hope that more open discussion will be stimulated, helping both "sides" to gain a clear perspective.

Few would disagree with the general statement that there are some areas of cable television in which a potential mutually-beneficial situation exists. One obvious example is the whole area of programming. The cable companies need the school district's special events in order to help fill the channels available on the new systems. They are paying hard cash in some cases to obtain programming from other sources. And here we have the schools, a potential "free" source of programming. Free programming in exchange for free channels and interconnection seems to be a relationship benefitting both the school and the cable company.

The central question for a commercial operation is "Will educational programming sell cable subscriptions?" The answer to that depends on the particular school uses. If supplementary classroom material is shown at night over the cable system, then the programming, of whatever quality, would probably result in more subscribers. However, since most cable systems have significantly less than 100% penetration, this use could be justifiably protested as being discriminatory. Even parents most willing to assist their children's education would likely balk when seeing this desire channeled through a commercial cable system.

This dilemma points up a problem which might be alleviated through public ownership and the probable lower fees, but which will never disappear until ways are found to reduce the subscription rate to zero. Revenue from leased and pay TV channels will help some, and other savings are possible. See the Mitre report for details on possible (and proven) saving in the use of electricity.

Even if less extreme dependency were created by more peripheral educational use of cable, the principle remains unchanged. To the extent that education uses the cable system effectively so to that same extent does it help the franchise. This should cause any clear thinking cableman to warmly encourage the school's development of cable as an educational distribution system. That warm encouragement would appear most clearly in the form of educational provisions similar to those mentioned in Chapter III.

Because the more dependency upon cable, the more profit, these educational provisions actually benefit the cable franchise holder as much as they do the schools. While this benefit is not instantaneous and 100% automatic, no investments are. The potential for return to the cable system operator is high and increasing. Because of the synergistic interaction that takes place when a CIS is built for a society, everyone stands to gain.

FOOTNOTES

1. Edwin B. Parker and Donald A. Dunn, "Information Technology: Its Social Potential," *Science,* Vol. 176, No. 20, June 1972, p. 1392.

2. Fred W. Friendly, Keynote speech at Publi-Cable Conference, May 5, 1972, p. 21. Available from NEA. See bibliography.

3. Depending on factors such as cable diameter, the number of drops, and the frequency range involved, the maximum length may be 3-30 miles. However, use of microwave can erase this limitation for a price.

4. *Cable Television in Detroit: A Study in Urban Communications,* City of Detroit, 1972, pp. 7-8.

5. "Possible School Uses of CATV," Metropolitan Nashville Education Association, Inc., June 21, 1971. Unpublished.

6. For additional ideas and assistance in developing visual communications curriculum, contact: Jon Shorr, Milford High School, 5701 Pleasant Hill Road, Milford, Ohio 45150.

7. Visual literacy: "A group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, and/or symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication." From a poster for the National Conference on Visual Literacy, March 2-5, 1972.

8. For some humorous examples of TV's power to create celebrities, see: Studs Terkel, "Image, Image on the Tube, Tell Me Who I Am," *Saturday Review,* Vol. LV, No. 27, July 1, 1972, pp. 12-14.

9. From a conversation with Allan Rucker of Media Access Center, Portola Institute, April, 1971.

10. The Bloomington, Minnesota Public Schools have received a Title III grant to explore and develop educational uses of the Bloomington cable system. For details, contact: Wayne Nelson, Coordinator of Audio-Visual Materials, Bloomington Public Schools, 10025 Penn Avenue South, Bloomington, Minnesota 55431.

11. "Such an 'on demand' retrieval system has recently been pilot-tested in Ottawa, Canada under Bell Telephone sponsorship. In this system the teacher merely consults a catalogue of available films and tapes, places a telephone call to the origination center, and is told at what time and on which channel her selection will appear. The usual lead time is only about one minute." From Michael H. Molenda, "CATV and Access to Knowledge," *Yale Review of Law and Social Action,* Vol. 2, No. 3, Spring 1972, p. 245. His source was C. A. Billows, "On Demand Educational Television Program Retrieval System for Schools," 59 *Proceedings* of the IEEE 998-1000, June, 1971.

12. Wm. C. Lewis, *Through Cable to Classroom* (Washington, D.C.: NEA, 1967). The lower figure: D. F. Mikes, *Schools and Cable Television* (Washington, D.C.: NEA, 1971). The higher figure: Cited by Molenda, p. 247. Much of what follows, relative to cost, is also Molenda, pp. 248-9.

13. For further elaboration of this point, see pages 7-9 in Ralph Lee Smith's *The Wired Nation,* New York: Harper & Row, 1972.

14. Molenda, *op. cit.,* pp. 249-50.

15. Several good articles to start with are Gerald Walker, "Special Report: Cable's Path to the Wired City is Tangled," *Electronics,* May 8, 1972; and Walter S. Baer, *Interactive Television Prospects for Two-Way Services on Cable,* RAND Report R-888-MF. November 1971.

16. Elaboration on this important point may be found in the testimony of Weston Vivian before the Illinois Commerce Commission, April 11, 1972.

17. This is a simplified description of the "standard home terminal 'Queset'" of Vicom Manufacturing Company. Taken from "Interaction Television-Interaction Terminals," March 18, 1971.

18. Research and development is making headway toward perfecting silicon storage tubes which could serve as frame grabbers, yet cost only $10-$15, in large quantities.

19. One set of cost estimates for various systems of this sort is included in an interesting paper by R. A. Dunn, "Cable Television Delivery of Educational Services," presented at the IEEE Eascon Conference, October 7, 1971.

20. A useful place to start that search might be Robert Bogus Law's *The New Utopians: A Study of System Design and Social Change* (New York: Prentice-Hall, 1965, 213 pp. $2.45). Recognizing that we are all practicing futurologists, whether or not we are conscious of it or good at it, a "Suggested Reading for Alternative Futures" is recommended to facilitate learning in this area. To get a copy, write The Future Center, University of Minnesota, Room 320, 720 Washington Avenue S.E., Minneapolis, Minnesota 55455.

21. For additional information contact: Bill Weir, Community Information Systems, Jonathan Village One Center, Chaska, Minnesota 55318.

22. From conversation with Wes Vivian, November 29, 1971, concerning the operation of the Overland Park system.

23. *Broadcasting,* June 21, 1971, p. 26. The information source was Wally Briscoe, NCTA managing director.

24. These figures and those that follow are taken from the written testimony of William W. Tifft, experienced free-lancer with half-inch equipment, submitted to the Metropolitan Council and the Citizens' League. Mr. Tifft may be contacted c/o Telenet, 13724 Nicollet Avenue South, Burnsville, Minnesota 55337.

25. Federal Communications Commission, "Letter of Intent," August 5, 1971, pp. 38-39.

26. Federal Communications Commission, *Report and Order Federal Register,* Feb. 12, 1972, Vol. 37, No. 10, Part II.

27. Dunn, *op. cit.*, p. 6.

28. For elaboration of this point read Peter Drucker's *The Age of Discontinuity,* especially Chapter 12, "The Knowledge Economy."

29. *New York Magazine,* March 22, 1971, p. 42.

30. *Crossed Wires, A Study of Cable Television in New Jersey,* The Center for Analysis of Public Issues, Princeton, 1971, p. 50.

31. Barnett, Stephen, "State, Federal and Local Regulation of Cable Television," *Notre Dame Lawyer,* April, 1972, p. 699.

32. Contact: The Governor's Blue Ribbon Task Force on Cable Communications, 27 East State Capitol, Madison, Wisconsin 53702.

33. Those interested in reflecting upon some of the regional problems might wish to obtain the "Report of the Advisory Committee on Cable Communications to the Metropolitan Council" from the Metropolitan Council, Suite 300 Metro Square Building, St. Paul, Minnesota 55101.

34. This idea and parts of the following were borrowed from *Schools and Cable Television.* See the Annotated Bibliography for source.

35. Those interested in municipal ownership should carefully study municipal and state laws to determine if such is currently possible or whether alterations may be required in existing legislation.

36. Monroe Price, "Cable Development and the Franchising Process," Unpublished working paper for the Sloan Commission on Cable Communications.

37. Statement of Stephen R. Barnett before the Illinois Commerce Commission, March 1, 1971, p. 10.

38. *Ibid.*

39. *Cable Television in Detroit: A Study in Urban Communications,* A Report Prepared by the Cable TV Study Committee for Common Council, Detroit: City of Detroit, 1972, pp. 30-31.

40. Comments of the Ford Foundation to the FCC, December 7, 1970 (Docket No. 18892, Amendment of Part 74, Subpart K), p. 14.

41. *Ibid.*, p. 12.

42. Molenda, *op. cit.*, p. 249.

43. Letter to Dr. John B. Ellery, Assistant to the Chancellor, Wisconsin State University, Stevens Point, Wisconsin, from Isaac K. Beckes, President, Vincennes University Junior College, Vincennes, Indiana, April 5, 1972, and reprinted in *Cable Communications in Wisconsin: Analysis of Recommendations,* Document No. 3 prepared by L. W. Lichty, Madison: Governor's Cable Commission, 1972, pp. 146-48.

44. Doxiades, Constantines, *Ekistics,* London: Oxford Press, 1967. Or the monthly, *Ekistics.*

45. Inose, Hiroshi, "Communication Networks," *Scientific American,* September, 1972. p. 117.

46. Asimov, Isaac, "The Fourth Revolution," *Saturday Review,* October 24, 1970, Vol. 43, No. 43, pp. 17-20.

47. Thompson, William Irwin, *At the Edge of History,* New York: Harper & Row, 1971, pp. 110-111.

48. Bertram G. Murray, Jr., "What the Ecologists Can Teach the Economists," *New York Times Magazine,* December 10, 1972, pp. 38, 39, 64, 65, 66, 67, 70, 72, is a thoughtful examination of the continuous growth versus no-growth question, though it does not deal with the possibilities of non-consuming growth.

49. Illich, Ivan, *Deschooling Society,* New York: Harper & Row, 1972, p. 108.

50. *Ibid.*

51. *Ibid.*, pp. 112-113.

AN ANNOTATED BIBLIOGRAPHY ON CABLE TELEVISION

I. THE MANY FACETS OF CABLE

Documents listed as being available from ERIC can be ordered from the ERIC Document Reproduction Service, P.O. Drawer O, Bethesda, Maryland 20014. They must be ordered by ED number. Individual Clearinghouses cannot fill these requests. In some cases, ED numbers have not yet been assigned; you should therefore write the Stanford Clearinghouse on Media and Technology, Center for Research and Development in Teaching, Stanford University, Stanford, California 94305, giving the EM number, to find out the ED number.

Reports Papers, and Books

Better Broadcasting Council, *A Model Ordinance for Cable Television for the City of Chicago*, Better Broadcasting Council, 1970, 15 pp., $2.

A good attempt to write the ideal ordinance, from a public interest perspective.

Write: Better Broadcasting Council, 53 W. Jackson Boulevard, Room 630, Chicago, Illinois 60604; or call: 312/922-1372.

Cable Television in Detroit, 1972, 162 pp., $5.

A carefully considered report from a citizen's advisory committee appointed by the city council; a good example of the service such committees can provide.

Write: City Clerk's Office, 1304 City-County Building, Detroit, Michigan 48226; or call: 313/224-3270. Also available from ERIC for 65c in microfiche and $3.29 in hardcopy. Write the Stanford Clearinghouse on Media and Technology for the ED number referring to document no. EM 010 382.

Cable Television Information Center.

A Suggested Procedure $2.
A Guide to Federal Regulation $3.
Cable Economics $3.
How To Plan An Ordinance $5.
Cable: An Overview $2.
Bibliocable $1.
A Glossary of Cable Terms 50c
Cable Data 50c

Annotation of these items and a description of the Center's publication service (one-time fee of $25) are included in Section V.

Write: Cable Television Information Center, The Urban Institute, 2100 M Street N.W., Washington, D.C. 20034; or call: 202/872-8888.

The Center for Analysis of Public Issues, *Crossed Wires: Cable Television in New Jersey*, Princeton, The Center for Analysis of Public Issues, 1971, 94 pp., $4. Less if necessary.

A superior work, essential to those seriously interested in CATV. A superb evaluation of the extensive experience of New Jersey municipalities with CATV. Included are listings of the important issues in franchise negotiations, as well as a sample CATV franchise. The importance of avoiding haste and of the many public service aspects is stressed.

_____, *Public Access Channels: The New York Experience*, Princeton, The Center for Analysis of Public Issues, 1972, 51 pp.

An excellent study of the first six months of operation of Manhattan's public access channels on both of its cable systems. Rules, costs, legal issues and examples are all covered.

Write: The Center for Analysis of Public Issues, 92A Nassau Street, Princeton, New Jersey 08540; or call: 609/924-9750.

Citizens' League, *Report of the Cable Communications Committee*, Minneapolis, Citizens' League Press, 1972. Single copies free.

After eleven months of study, this non-profit, public-interest research corporation has produced an excellent report, whose recommendations focus on the need for state involvement.

Write: Citizens' League, 503 Syndicate Building, 84 S. 6th Street, Minneapolis, Minnesota 55402; or call: 612/338-0791.

Cypress Communications Corporation, "Plan for Minority Participation in a Cypress Cable System in Dayton, Ohio," Los Angeles, Cypress Communications Corporation, 1972, 16 pp.

One of the best examples of minority joint ownership with a major cable company.

Write: Leon Papernow, Cypress Communications Corporation, 10880 Wilshire Boulevard, Los Angeles, California 90024; or call: 213/475-8555.

Electronics Industry Association, "The Future of Broadband Communications: The IED/EIA Response to Federal Communications Docket 18397, Part V," a position paper prepared by the Industrial Electronics Division of EIA, Washington, Electronics Industry Association, 1969, 41 pp. (mimeo.)

Broad-range long-term thinking from the electronics industry, covering many of the myriad uses of coaxial cable; e.g. electronic mail, banking, and shipping, automated libraries, and all the rest.

Write: Donald Witheridge, Director of Public Relations, National Cable Television Association, 918 16th Street N.W., Washington, D.C. 20006; or call: 212/466-8111. Free. If NCTA is out, write: IED/EIA, 2001 Eye Street N.W., Washington, D.C. 20006. $5.

Federal Communications Commission, *Community Antenna Television (CATV)*, Information Bulletin 22-D (November, 1970), 16 pp.

A handy short history of cable, and federal regulation of it.

Write: Federal Communications Commission, Office of Information or Cable Television Bureau, 1919 M Street N.W., Washington, D.C. 20554; or call: Information Office, 202/632-7260 or CATV Bureau, 632-6480. Also available from ERIC as ED 064 946 in microfiche for 65c and hardcopy for $3.29.

_____, Report and Order, *Federal Register*, February 12, 1972, Vol. 37, Number 10, Part II, Washington, D.C., G.P.O., 1972, 90 pp., 20c.

Must reading. It establishes the federal regulatory framework for cable television. Into 12 small print pages is condensed the new federal law on "applications and certificates of compliance, federal-state/local regulatory relationships, carriage of television broadcast signals, program exclusivity, cablecasting, general operating requirements, forms and reports, diversification of control and technical standards."

_____, "Cable Television Service: Reconsideration of Report and Order," *Federal Register*, Vol. 37, No. 136, Part 2, July 14, 1972, 20c.

The reconsideration is helpful in clarifying the above report and order, as well as including a few minor changes.

Write: Government Printing Office, Washington, D.C. 20402, specifying the exact citation.

Ford Foundation, "Comments of the Ford Foundation in Response to the Commission's Notice of Proposed Rule Making of July 1, 1970, in the Above Entitled Matter" (FCC Docket No. 18892, Amendment of Part 74, Subpart K), New York, Ford Foundation, 1970, 32 pp.

A well-reasoned argument for public ownership of cable systems, among other things.

Write: The Ford Foundation, Office of Public Broadcasting, 320 E. 43rd Street, New York, New York 10017; or call: 212/573-5000.

Founders Annex, *Cable in Massachusetts*, 1972, 38 pp., $1.50.

An excellent rundown on cable franchizing activity in Massachusetts, especially good on ownership research. It should be an inspiration for similar work to be done in other states.

Write: Founders Annex Public Service Project, Box 504, Beverly, Massachusetts 01915.

Fred Friendly, "Fast-Talking Ourselves Through the Communication Revolution," remarks delivered at PubliCable Conference, May 5, 1972, 15 pp.

An eloquent indictment of U.S. telecommunication development and a stirring call to "immerse yourselves in the decision-making process."

Write: PubliCable, DET/NEA, 1201 16th Street N.W., Washington, D.C. 20036; or call: 202/833-4120. Also available from ERIC as ED 066 019 in microfiche for 65c and hardcopy for $3.29.

Illinois Commerce Commission, "Notice of Inquiry and Proposed Rule Making–Broadband Cable Communication," Springfield, Illinois Commerce Commission, 1972, 48 pp.

In its Docket No. 56191, "Investigation of Cable Television and Other Forms of Broadband Cable Communications in the State of Illinois," the I.C.C. also distributes a summary of the testimony. This rule making contains many sound regulatory ideas, such as detailed procedural standards and requirement of 2, 3, or 4 cables based on population.

Write: L. Michael Fultz, Illinois Commerce Commission, 527 East Capitol Avenue, Springfield, Illinois 62706; or call: 217/525-2146.

International City Management Association, "Drafting Municipal Franchises for Cable Television Systems," in *Management Information Service*, Vol. 4, No. LS-1, Washington, D.C., International City Management Association, 1972, 23 pp., $1.

An unexcelled step by step guide to drafting municipal franchises for cable communications. It also covers quite well the ordinance provisions which municipalities should consider for inclusion.

Write: International City Management Association, 1140 Connecticut Avenue N.W., Washington, D.C. 20036.

Nicholas Johnson, Opinion in re (Docket No. 18397); Report and Order, Concurring in Part and Dissenting in Part, Washington, D.C., FCC, 1972, 32 pp.

Eloquent, outspoken words from FCC Commissioner Johnson, e.g., "In future years, when students of government wish to study the decision making process at its worst, when they look for industry domination of government, when they look for Presidential interference in the operation of an agency responsible to Congress, they will look to the FCC handling of the never-ending saga of cable television as a classic case study. It is unfortunate, if not fatal, that the decision must be described in these terms, for of the national communications policy questions before us, none is more important to the country's future than cable television." (p. 2)

The following speech reprints are also available free from his office: "CATV: New Hope for Minorities"; "Another Kind of Cable: A Challenge to Rural Electric Coops in the 1970's"; "CATV: The New Frontier in Public Service Programming"; "The Careening of America, or How to Talk Back to Your Corporate State."

Write: Commissioner Nicholas Johnson, Federal Communications Commission, 1919 M Street N.W., Washington, D.C. 20544; or call: 202/632-7557.

League of California Cities, *Cable Television Report and Suggested Ordinance*, Sacramento, California, 1972, 77 pp., $10 (plus tax).

This overpriced report does contain a helpful annotated ordinance, and some needed technical and economic information in the appendices.

Write: League of California Cities, 1108 O Street, Sacramento, California 96814; or call: 916/444-5790.

Ted Ledbetter and Gilbert Mendelson, *The Wired City: A Handbook on Cable Television for Local Officials*, Washington, Urban Communications Group, 1972, 87 pp., $2.95.

Useful to anyone interested in cable and, in particular, franchising.

Write: Cable Television Information Center, 2100 M Street N.W., Washington, D.C. 20037; or call: 202/872-8888 (distributor). Produced by Urban Communications, 1730 M St. N.W., Suite 405, Washington, D.C. 20036.

The Mitre Corporation, *Urban Cable Systems*, McLean, Virginia, Mitre Corporation, June, 1972, 400 pp., $2.

An excellent analysis of the needs and services which urban cable systems can fulfill, their technical implications, and a demand analysis. This is followed by a proposed system design and implementation schedule using the Washington, D.C. area as an example which includes an integrated large scale demonstration and a financial analysis. One of the proposals is to establish three point-to-point cable networks for special public service uses, such as in education, in addition to the standard system for everyone.

Three very short, very simple booklets are also available explaining the uses of two-way cable systems generally and the Reston, Virginia, TICCIT system in particular. They are: *Interactive Television Software for Cable Television Application* by Kenneth Statten, MTP-354; *TICCIT: A Delivery System Designed for Mass Utilization*, M71-56; and *The Reston, Virginia Test of the Mitre Corporation's Interactive Television System*, MTP-352.

Write: Mitre Corporation, Westgate Research Park, McLean, Virginia 22101. *Urban Cable Systems* also available from ERIC as ED 010 194 for 65c in microfiche and $3.29 in hardcopy.

National Academy of Engineering, *Communication Technology for Urban Improvements. A Report of the Committee on Telecommunications*, Washington, D.C., National Academy of Engineering, 1971, $3.

This report largely consists of outlines for project proposals.

Write: National Academy of Engineering, Committee on Telecommunications, 2101 Constitution Avenue N.W., Washington, D.C. 20481; or call: 202/393-8100.

National Cable Television Association, 1971 Official Transcript, 20th Annual NCTA Convention, $9. 1972 Transcript is also now available.

Well worth the price; topics range from "I Am Curious (Cablecasting)," through "Everything You've Always Wanted to Know About Rate Increases, But Were Afraid to Ask," to "State Regulation" and lots more.

_____ *The Selling of Cable Television 1972*, NCTA Marketing Workshop Transcript, paperback, $2.95 for non-members .

It helps to know the industry's tactics.

Many other free items are available on different aspects of cable's past, present and future. Most are light reading, but the historical summaries are useful.

Write: Director of Public Relations, NCTA, 913 16th Street N.W., Washington, D.C. 20006; or call: 202/466-8111. *CATV; The New Communicator*, 21st Annual NCTA Convention Official Transcript (1972) is available also from ERIC. Write the Stanford Clearinghouse for the ED number referring to document No. EM 010 331, 65c in microfiche and $23.03 in hardcopy.

New York State Public Service Commission, *Regulation of Cable Television by the State of New York*, Report to the Commission by Commissioner William K. Jones, December, 1970, 220 pp. plus appendices, $5. (Mimeographed.)

A very thorough work, covering many areas of cable television, and bringing together lots of background information.

Write: Francis Rivett, Public Service Commission, 44 Holland Avenue, Albany, New York 12208; or call: 518/474-7080.

Jerrold Oppenheim, and 8 Chicago aldermen, "Model Code of Regulations for Cable Television and Broadband Communications," September, 1971, 23 pp., $1.50.

A model ordinance containing many fine features.

_____, "Soapbox Television," 33 pp., $2.

Thoughts on using public access channels as public forum. A summary of this is free.

Write: American Civil Liberties Union, 6 South Clark Street, Chicago, Illinois 60603; or call: 312/236-5564.

Philadelphia City Planning Commission, *Telecommunications Needs for Municipal Functions in Philadelphia*, Part I: The Libraries. Part II: The Department of Public Health, a staff paper by Division of General Research, Philadelphia City Planning Commission, 1970. (Mimeographed.) I/13 pp., II/13 pp.

This paper's purpose "... was to obtain some guidelines for the possible effect of telecommunications on the location and distribution of various public facilities in Philadelphia, among their branch libraries, neighborhood health centers, schools and so on."

Write: The Division of General Research, Philadelphia City Planning Commission, City Hall Annex, 12th Floor, Philadelphia, Pennsylvania 19107; or call: 215/686-4620.

Fred Powledge, *An ACLU Guide to Cable Television*, New York, ACLU, 1972, 46 pp., $1.

A work largely introductory in nature spiced with some incisive quotations. Ten pages cover the ACLU position on cable issues.

Contact: American Civil Liberties Union, 22 E. 40th Street, New York, New York 10016.

Monroe Price and John Wicklein, *Cable Television: A Guide for Citizen Action*, Philadelphia, Pilgrim Press, 1972, 160 pp., $2.95 (paper) $5.95 (hardbound), one free copy to each community.

This is a 'how-to' book–meant for public spirited citizens who want to participate in decisions affecting their lives, for local government officials who want to do the best job possible in furnishing services to their citizens, and for community organizations and political leaders who want to think about and experiment with cable as a fundamental means of communication among their constituents.

Write: Office of Communications, United Church of Christ, 289 Park Avenue South, New York, New York 10010; or call: 212/475-2127.

Rand Corporation, Reports, Memos and Papers (Cost varies relative to length).

Good, but not great. The many varied Rand materials cover a wide range of communications topics. They include Reports on CATV and: satellites, ombudsmen, education, urban development, local origination, broadcasting, monopoly problems, 1st amendment rights, prospects for cable in the top 100 markets, and the future. Of special note are:

Cable Communications in the Dayton-Miami Valley: Basic Report, by L. L. Johnson and others, R-943 KF/FF, January 1972, $5.

Ten separate papers, introduction, summary and appendices make this thick volume a major document on the question of "What is the best approach to cable for a metropolitan area?"

Cable Communications in the Dayton-Miami Valley: Summary Report, by Leland Johnson, R-942 KF/FF, January, 1972, 43 pp., $3.

Common sense dictated providing an easier path to understanding the Dayton study than the ponderous Basic Report. The summary has three core sections: The technology and economics of advanced cable systems, new and expanded services, and franchising and ownership of cable systems. This study deserves the full consideration of all interested in metropolitan area cable systems.

Read at library or write: Communications Department, the Rand Corporation, 1700 Main Street, Santa Monica, California 90406. *Summary Report* also available from ERIC for 65c in microfiche and $3.29 in hardcopy. Write the Stanford Clearinghouse for the ED number referring to document no. EM 010 131.

SEMCOG, *A Preliminary Report Concerning the Problems and the Potential of Community Antenna Television, CATV, in Southeast Michigan*, Detroit, Southeast Michigan Council of Governments, 1971, 28 pp.

An excellent report by Patrick Kenney on the important issues to be considered, from a metropolitan and municipal perspective, in looking at cable communications and its tremendous impact. It suggests fully involving school systems and the establishment of a citizens' cable commission with full regulatory powers.

Write: SEMCOG, Book Building, 8th floor, Detroit, Michigan 48226; or call: 331/961-4266.

Hubert J. Schlafly, *The Real World of Technological Evolution in Broad-Band Communications*, a report prepared for the Sloan Commission on Cable Communications, September, 1970, 45 pp.

The best single introduction to cable technology for the lay(wo)man. Written in a highly readable manner. The reader can get through it and come away with a sound understanding of how a cable system works.

Write: Hubert Schlafly, TelePrompTer Corporation, 50 West 44th Street, New York, New York 10036. Also available from ERIC as ED 062 795 in microfiche for 65c and hardcopy for $3.29.

Michael Shamberg and Raindance Corporation, *Guerrilla Television*, New York, Holt & Rinehart, 1971, 108 pp., $3.95.

An experienced worker in the alternative television movement reviews the lessons learned and the philosophy he's developed.

Arthur L. Singer, Jr., *Issues for Study in Cable Communications*, An Occasional Paper from the Alfred P. Sloan Foundation, New York, Alfred P. Sloan Foundation, 1970, 19 pp.

Singer asks many of the right questions about the proper direction of cable communications.

Write: Alfred P. Sloan Foundation, 630 Fifth Avenue, New York, New York 10020; or call: 212/582-0450. Also available from ERIC as ED 044 943 in microfiche for 65c and hardcopy for $3.29.

Sloan Commission on Cable Communications, *On the Cable: The Television of Abundance*, New York, McGraw-Hill, 1971, 256 pp., $2.95.

This report does not live up to the promise of the many excellent working papers which formed the raw materials of this book. To get some of the working papers, write the Sloan Foundation.

Ralph Lee Smith, *The Wired Nation*, New York, Harper & Row, 1972, 128 pp., $1.95.

Still the best single explanation of cable: its history, power struggles, public interest issues, and important statistics. An older, shorter version of this appeared in the May 18, 1970 issue of *The Nation*.

Judith Strasser, *Why Wire the Nation?* Stanford, California, Institute for Communication Research, 1970.

A political analysis of the cable scene, arguing for resistance to division-producing technology such as CATV until the benefits can be equally shared. Other material is also available.

Write: Edwin Parker, Institute for Communication Research, Stanford University, Stanford, California 94305; or call: 415/321-2300, x2755.

Charles Tate, *Cable Television in the Cities: Community Control, Public Access, and Minority Ownership*, Washington, D.C., The Urban Institute, 1971, 184 pp., $3.95.

Its contents include an overview of cable, excellent sections on community control and local origination, a poor section on municipal regulation, a very helpful discussion on minority business opportunities, and an outstanding reference and resource guide.

Write: The Urban Institute, Department C, 2100 M Street N.W., Washington, D.C. 20037; or call: 202/223-1950.

United Church of Christ, *A Short Course in Cable*, Office of Communications, New York, United Church of Christ, 1971, 12 pp., 25c.

A very helpful introduction to topics like, "How to Get Good Cable Service for Your Community," "Community Supervision," and "Municipal Responsibility." If you like this, you'll love *Cable Television: A Guide for Citizen Action* by Price and Wicklein.

Write: Office of Communication, United Church of Christ, 289 Park Avenue South, New York, New York 10010; or call: 212/475-2127.

Urban Planning Aid, Inc., "Community Control?" An information packet on cable TV.

This packet raises most of the important social issues in a simplified form and includes several short items ideal for mass distribution.

Contact: The Media Project, Urban Planning Aid, Inc., 639 Massachusetts Avenue, Cambridge, Massachusetts 02139; or call: 617/661-9220.

Journal Articles

Arthur Alpert, "Crossed Wires: Cable TV and the Public Interest," *Washington Monthly*, July 1969, pp. 35-46.

An aged but informed history of cable, especially good on political analysis of developments in federal regulation and on the national power struggle over cable.

Isaac Asimov. "The Fourth Revolution," *Saturday Review*, Vol. 53, No. 43, October 24, 1970, pp. 17-20.

A well-reasoned overview of communications revolutions and their effects on civilizations that contains much food for thought. We're in the fourth revolution now, i.e., developing instant "any" communication through satellites and cable.

Stephen R. Barnett, "Cable Television and Media Concentration. Part I: Control of Cable Systems by Local Broadcasters," *Stanford Law Review*, Vol. 22, January 1970, pp. 221+.

"The present article, after providing rather extensive background, will focus on the issues raised by common control between cable television systems and television or radio broadcast stations serving the same market." Easy to read, important and quite well documented.

_____, "State, Federal, and Local Regulation of Cable Television," *Notre Dame Lawyer*, Vol. 47, No. 4, April 1972, pp. 685+, $2.

The best article on the problems and potentials of the different regulatory levels, including an outline of needed state regulations.

Write: Box 486, Notre Dame, Indiana 46556; or call: 219/283-7097.

Edward W. Barrett, "CATV–Pitfalls and Horizons," *New York Times*, August 20, 1971, 33:3.

A very concise article, touching on many good points. One of the best one-pagers on cable.

"Communication," A special issue of *Scientific American*, September 1972, Vol. 227, No. 3, 212 pp.

Eleven excellent articles covering a wide range of approaches to the topic (Cellular Communication to Communication and Social Environment).

"Community Cable TV and You," National Film Board of Canada, *Challenge for Change Newsletter*, February 1971, 12 pp.

This cartoon-assisted introduction to CATV is a joy to read and guaranteed to communicate the basics of CATV to anyone. Subscribe to the *Newsletter*; it's free, fun and relevant.

Write: Access Newsletter, N.F.B., P.O. Box 6100, Montreal 101, Quebec, Canada.

IEEE Proceedings, Special Issue on Cable TV, July 1970, Institute of Electrical and Electronic Engineers.

Quite technical, for the most part. But then, if you're serious about cable. . .

Byron Jarvis, "Everything You Always Wanted To Know About . . . What All Those Guys Writing Reports Don't Know," *CATV*, November 13, 1972, pp. 63-74.

A "Special Report on Reports" from the cable industry's perspective picks apart non-industry reports generally, using Mitre's *Urban Cable Systems* as "a prime example." Useful for local decision-makers because you'll be getting less eloquent versions of these arguments from your local cable contacts. Be prepared by knowing the limitations of your information.

Nicholas Johnson, "CATV: Promise and Peril," *Saturday Review*, Vol. 50: November 11, 1967, pp. 87-88 and 96-98.

The Ralph Nader of the FCC has many worthwhile thoughts on cable. This article makes up the only cable chapter of his book, *How to Talk Back to Your Television Set*, New York, Bantam, 1970, 95c.

_____, "What Do We Do About Television?" *Saturday Review*, Vol. 53, No. 28, July 11, 1970, pp. 14-16 and 34-35.

This is mainly about broadcast television public interest tactics, but there are three incisive paragraphs on cable on the last page.

Ronald K. Jurgen, "Two-way Applications for Cable Television Systems in the 1970's," *IEEE Spectrum*, November 1971, pp. 39-54.

A most helpful review of the two-way systems in operation to date, technical in parts.

Kass Kalba, ed., "The Cable Fable," *Yale Review of Law and Social Action*, Spring, 1972 issue, Vol. 2, No. 3, 106 pp., $4.

An activist-oriented collection of excellent articles on many of the most crucial social issues in cable.

Write: Yale Law School, Box 87, New Haven, Connecticut 06520; or call: 203/436-0286.

Don R. Le Duc, "The Cable Question: Evolution or Revolution in Electronic Mass Communications," *The Annals of the American Academy of Political and Social Science*, Vol. 400, March 1972, p. 139.

Dennis B. McAlpine, "The Cable Television Industry," *The Wall Street Transcript*, Vol. XXXIII, No. 13, September 27, 1971, pp. 25,549+.

An extremely helpful look at the basic economics of cable, plus an analysis of Cox Cable Communications and Tele-Communications, Inc. (since merged).

Jerrold N. Oppenheim, "Cable TV Comes to Clout City," *Chicago Journalism Review*, Vol. 4, No. 8, August 1971, pp. 3-14, 50c.

A picture of the politics surrounding Chicago's present cable television activity. A line-up of the cable contenders in this pre-ordinance period.

_____, "Cable Television: Channels for Dissent," *Civil Liberties*, December, 1971, pp. 1 and 15.

A good basic introduction to cable, some of the social problems it raises, and proposed guidelines for solutions.

Paul Ryan, "The Raw and the Overcooked," *Media and Methods*, Vol. 6, No. 2, October 1969, pp. 48-50 and 60.

Provocative, sometimes obscure ideas on the meaning of it all. "Cable can serve not merely as a conduit to total information, but more importantly, each separate system can provide the skeleton of an information structure in which students can build up the indigenous data base necessary for self-cybernation." (p. 50). Ryan has written other things which can be found in the *Radical Softwares*, and a recently released book on *Cybernetics of the Sacred*, Gordon & Breach, 1972.

Robert Lewis Shayon, "Cable Revisions," *Saturday Review*, December 11, 1971, p. 14.

Shayon, *Saturday Review*'s regular TV-radio columnist, suggests in a reasonable fashion that the FCC soon require cable operators to "choose between being 'common carriers' (distribution systems) and program suppliers. The danger inherent in allowing cable operators to play both roles indefinitely is that they will specialize in providing entertainment at the cost of restricting the other communication services." Though seldom discussing cable directly, his columns are worthwhile reading.

Ralph Lee Smith, "The Wired Nation," *The Nation*, Special Issue, Vol. 210, No. 19, May 18, 1970, 24 pp., 10/$3.

The best single explanation of cable; its history, power, struggles, public interest issues, and important statistics.

Write: *The Nation*, 333 Sixth Avenue, New York, New York 10014.

Ithiel de Sola Pool, "Social Trends," *Science and Technology*, No. 76, April 1968, a special issue on "The Communication Revolution," pp. 87-101.

"The new (communications) technology will tend to substitute for the mass media an interactive medium that can adjust to each user's desires and thus introduce into society a powerful force toward fragmentation and variety" (p. 87). Long-range thoughts from the chairman of MIT's Political Science Department.

Jules S. Tewlow, "CATV in Perspective," American Newspaper Publishers Association Research Institute, *R.I. Bulletin*, No. 1029, September 25, 1970, pp. 369-404.

An excellent summation of FCC actions and considerations on CATV, plus an easy-to-read review of technological advances like two-way systems, video cassettes, laser, and satellites. Tewlow has authored many other fine reports as well.

Write: ANPA Research Center, Box 598, Easton, Pennsylvania 18042; or call: 215/253-6155.

Gerald M. Walker and others, "Stringing the Wired City: Two-way TV Descends from Blue Sky to Real World," *Electronics*, September 27, 1971, pp. 44-55.

A systems approach to cable, the Mitre system at Reston, the various two-way services and some cost estimates, computer hook-ups, and time-division multiplexing are discussed by different authorities in the field.

Stephen White, "Toward a Modest Experiment in Cable Television," *The Public Interest*, Summer 1968, pp. 52-66.

Explains in easily understandable terms, the magnitude of the change CATV could bring about. Focuses on advantages of guaranteed hook-ups and adequate access for an informationally-isolated community like Bedford-Stuyvesant in Brooklyn.

II. THE EDUCATIONAL FACETS OF CABLE

The titles in this section have special interest for educators. For further guidance see Michael H. Molenda's "The Educational Implications of Cable Television (CATV) and Video Cassettes: An Annotated Bibliography" in the April, 1972 issue of Audiovisual Instruction.

"AECT Board of Directors' Position on Cable Television," *Audiovisual Instruction*, Vol. 16, No. 6, June/July 1971, p. 105.

D. Alpert and D. L. Bitzer, "Advances in Computer-based Education," *Science*, March 20, 1970, pp. 1582-1590.

Association for Educational Communications and Technology, "Position Paper on Community Antenna Television," *Audiovisual Instruction*, 16:9, November 1971, pp. 56-65.

Dean M. Austin, "Two Way Education at Brigham Young University" (Two Way Cable Television System), *Educational Media*, 4:1 August/September 1971, p. 405.

Roscoe L. Barrow and Daniel J. Manelli, "Communications Technology–A Forecast of Change (Part I)," *Law and Contemporary Problems*, XXXIV Spring 1960, pp. 205-243.

C. A. Billowes, "An Experimental System Information Retrieval," *TV Communications*, March 1970.

D. Bitzer, E. Lyman, and J. Easley, Jr., "The Uses of PLATO," *Audiovisual Instruction*, January 1966.

D. Bitzer and D. Skaperdas, *The Design of an Economically Viable Large-Scale Computer Based Education System*, Computer-based Education Research Laboratory, University of Illinois, February 1969.

Sandra W. Bennett, "Ascertainment of Community Needs: Where is Public Broadcasting?" *Educational Broadcasting Review*, February 1972, pp. 20-25.

Kenneth T. Bird, "Tele-Diagnosis: A New Community Health Service," *Educational/Instructional Broadcasting*, 2 February 1969, pp. 18-21.

Bill Blackburn, "How We Cablecast," *VIEW Cablecasting and Educational TV*, 4:5 October 1966, pp. 15, 17, 21.

J. Robert Burull, "CATV and the Local Schools–The Winning PR Team," *TV Communications*, December 1969.

"CABLE-TV–Education at Home," *The Voice*, Pennsylvania State Education Association, February 7, 1972, p. 405.

"Cable TV–Protecting its Future in Education," *Interpretations*, November 1971. An Occasional Paper published by the Association for Supervision and Curriculum Development, National Education Association, 8 pp.

This fine short paper on education and cable is the best piece available, given the length and topic. It eloquently summarizes much of the best in *Schools and Cable Television.*

A copy available free if you send a stamped, self-addressed envelope to: ASCD, National Education Association, 1201 16th Street N.W., Washington, D.C. 20036. More copies cost 15c each. Also available from ERIC as ED 056 481 in microfiche for 65c and hardcopy for $3.29.

Carnegie Commission on Higher Education, *The Fourth Revolution: Instructional Technology in Higher Education*, Hightstown, New Jersey, McGraw-Hill, 1972, 112 pp., $1.95.

". . . Emerging educational technology is not a bag of mechanical tricks, but the organized design and operation of learning systems."

"The CATV-ETV Interface: Basically Smooth, but With Some Friction Spots," *Cable Management/Engineering* (Supplement to *Broadcast Management/Engineering*), November 1970.

"CATV Via Satellite Proposed," *Audiovisual Instruction*, 14:8 October 1969, pp. 108-109.

Chicago Area School Television, Inc., *CATV: Its Implications for Illinois Schools*, prepared for Chicago Area School Television, Inc., March 1, 1971. Statement to Illinois Commerce Commission, by Marjorie B. Hopper, 44 pp.

"City of Cardiff on Closed Circuit," *Times* Educational Supplement, Vol. 2697 January 27, 1967, pp. 284-285.

"Classroom in the Home Via Cable," *Broadcast Management/Engineering*, October 1971.

"Closed-Circuit Television Expands Thornton Township's Horizons," *Illinois Education*, Vol. 56 November 1967, pp. 116-117.

"College Comes to New York Cable Subscribers," NCTA Bulletin, Vol. 1:1 September 28, 1971, p. 2.

"Community Antenna Television (CATV)," *E Report*, Albany, New York, Division of Educational Communications, University of the State of New York, State Education Department 12224, March 1971, 10 pp.

"Computers in the Classroom," *News Front*, February 1968, pp. 35 ff.

D. J. Connors and W. Schragg, "Direct Wire TV," *Minnesota Journal of Education*, 44 October 1963, pp. 11 ff.

Division of Instruction and Professional Development, Technology Section, NEA, "Special Feature on Cable Television," *Today's Education*, 60:80 November 1971, pp. 52-56.

Edward E. Drake, "Educators and CATV: A Natural Alliance," *TV Communications*, March 1969.

_____ , "How Our CATV Systems Serve ETV/ITV," *Cablecasting and Educational Television*, 4:7 July 1968, pp. 22-23.

D. A. Dunn, "Cable Television Delivery of Educational Services," a paper presented at IEEE Eascon Conference, October 6-8, 1971, Washington, D.C., Mimeographed, 7 pp.

A most helpful examination of four types of instructional TV systems (three being interactive) and their typical costs. Slightly technical, but well worth wading through.

Write: D. A. Dunn, Engineering-Economic Systems Department, Stanford University, Stanford, California 94305, or the Institute for Communication Research also at Stanford.

Ken J. Easton, "Space Diversity Reception for CATV," *Cablecasting & Educational Television*, Vol. 3:4 September 1967, pp. 13 ff.

Educational Research and Development Council, *A Cable TV Guide for Educators: Uses and Provisions*, a booklet by Jon Shafer, St. Paul, ERDC, 1972, 52 pp., $1.50.

A useful guide designed for educators and others in areas now franchising. An earlier, shorter version of this ERIC document.

Write: ERDC, 221 Student Health Service Building, University of Minnesota, St. Paul, Minnesota 55101; or call: 612/373-4860.

"Educational Program for Cable TV," *Cablecasting and Educational Television* (Formerly *VIEW*) 4:7 July 1968, pp. 18-19.

Educational Provisos: Cable TV (CATV) Ordinance, Town of Huntington, Long Island, New York, Stony Brook, New York; Suffolk County Organization for the Promotion of Education (SCOPE), n.d. (Mimeographed reprint).

W. E. Evans, "Selection of CATV Components," *Cablecasting and Educational Television*, 4:7 1968, pp. 24-29.

H. Finkelstein, "Copyright Revision–Music: CATV, Educational Broadcasting and Juke Boxes," *Iowa Law Review*, Vol. 58 February 1968, pp. 870 ff.

"Firm Tests CAI/CATV Community Education System," *Report on Education Research*, August 4, 1970, pp. 4-5.

Frederick W. Ford, "Cable TV and Educational Broadcasting–New Partnership for Progress," NCTA Membership Bulletin (President's Letter), October 3, 1967, p. 1.

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W. J. Hageny, "Electronic Wonderland: Harbinger of the Future," *New York State Education*, Vol. 55 April 1968, pp. 14-15.

William G. Harley, "The Common Concerns of Educational Television & CATV," *Cablecasting and Educational Television* 4:7 1968, pp. 20-21.

R. P. Haviland, "Possible Technical Standards for Educational and Community Television Satellite," Journal of the *SMPTE*, March 1972, pp. 162-164.

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_____, "Cable Television: Long Island," *Today's Education* 59 November 1970, pp. 37-39.

_____, "ITV and CATV: A Natural Marriage," *Audiovisual Instruction* 13 December 1968, pp. 1062-1063.

Marjorie Hopper, *An Orientation to CATV*, Chicago Area School Television, Inc., 1971, 6 pp.

Robert B. Hudson, *The Future of Educational Television*, Washington, D.C., Academy for Educational Development, Inc., 1968, 38 pp.

Joint Council on Educational Telecommunications (JCET), "JCET Data Base: CATV," *Twenty Percent of System Capacity–The JCET Position on CATV*, Washington, D.C., JCET, June 1971.

J. M. Jones, "TV in Schools: Cable System Not the Only Answer," *Times Educational Supplement*, April 1969, pp. 1185-2812.

Ken Jones, "Community Television," *Adult Education* (Great Britain), Vol. 37 March 1965, pp. 313-326.

P. Lewis, "CATV: The Future Channel for Local School Programs?" *Nation's Schools*, February 1970, pp. 85-92.

_____, "CATV: To Provide Total Communications Concept," *Nation's Schools*, September 1971, p 81+.

William C. Lewis, *Through Cable to Classroom–A Guide to ITV Distribution Systems* (Edited by Henry T. Ingle), Washington, D.C., Association for Educational Communications and Technology, National Education Association, 1967, 44 pp., $2.

Harold Livingston, "Between College and Community: CATV Provides the Perfect Link," *TV Communications*, March 1970.

_____, "An Educator Looks at the FCC Proposals," *TV Communications*, January 1971.

L. Marchese, "Cable TV and Adult Education," *Adult Leadership:* 19 March 1971, pp. 299-300.

Howard S. Martin, "Educational and Instructional Programming for CATV," *Educational/Instructional Broadcasting*–The International Journal of Educational Radio and Television, 4:5 May 1971, p. 28.

Mary Alice Mayer, "An Historical Study of the Issues and Policies Related to the Educational Application and Utilization of Community Antenna Television Inclusive of 1949, Exclusive of 1969," Ph.D. Thesis, Northwestern University, 1969.

Jack R. Messerli, "Rerun–the Case of An Impossible Noise Source on CATV," *Cablecasting and Educational Television* 4:8 August 1968, pp. 15-17.

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Michigan Department of Education, "List of Educational Provisos Recommended to be Included in Negotiations Between Local Government Agencies and Community Antenna Television Companies Applying for Franchises," 1970, Mimeographed, 4 pp. Distributed to schools in Michigan.

Michael H. Molenda, *Annotated Bibliography on the Educational Implications of Cable Television (CATV)*, Greensboro, North Carolina, University of North Carolina, January 1972, 28 pp. Available from ERIC as ED 059 607 for 65c in microfiche and $3.29 in hardcopy.

_____, "CATV and Access to Knowledge," *Yale Review of Law and Social Action*, Spring 1972.

_____, "The Educational Implications of Cable Television (CATV) and Video Cassettes: An Annotated Bibliography," *Audiovisual Instruction*, April 1972, pp. 42-59.

Donald E. Morrison (President), *Petition for Reconsideration Before the Federal Communications Commission by the National Education Association of the United States*, Docket No. 18397, March 10, 1972, 7 pp.

M. E. McCombs and L. G. Didow, "Economic Constraints on Television and Future News Technologies," paper presented to convention of the Association of Educational Journalism, Radio TV Division, University of North Carolina, Chapel Hill, August 1971.

National Association of Educational Broadcasters, *Television Cartridge and Disc Systems: What Are They Good For?* 57 pp., Washington, D.C., February 1971.

National Academy of Engineering Commission on Education, Report by the Instructional Technology Committee, *Educational Technology in Higher Education: The Promises and Limitations of ITV and CAI*, September 1969.

National Education Association, *Schools and Cable Television*, A booklet prepared by the Division of Educational Technology, Washington, National Education Association, 1971, 66 pp., $2.25. 10% off for 2-9; 20% off for 10 and up. Available from ERIC as ED 049 637 in microfiche for 65c.

Superb. "... the reason for this publication–to alert the teaching profession to the opportunities and options available in the development of cable television and to offer guidelines for the sound development of this new communications system in the public interest in the years ahead" (p. vi).

_____, *Man-Made Moons: Satellite Communications for Schools*, 1972, 48 pp., $3. Available from ERIC as ED 062 813 in microfiche for 65c.

"*Man-Made Moons* wakes up educators to the fact that they had better start planning today for what promises to be the key to the ultimate education network–communication satellites. The 1970's will be the decade for satellite experimentation for education."

Write: NEA Publications–Sales Section, 1201 16th Street N.W., Washington, D.C. 20036; or call: 202/833-4321.

John A. Niemi, "The Davey Report: Whither Cablecasting?" *Educational/Instructional Broadcasting*, March 1971, p. 33.

F. W. Norwood, "CATV and Educational TV," *Audiovisual Instruction*, 13 December 1968, pp. 1058-1061.

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New York State Education Department, "Cable Television Information Packet," compiled by Dr. Bernarr Cooper.

Write: Bureau of Mass Communications, Division of Educational Communications, Room 874, State Education Dept., Albany, New York 12224.

Edwin B. Parker and Donald A. Dunn, "Information Technology: Its Social Potential," *Science*, 176 June 1972, pp. 1392-1399.

"The greatest single potential of an information utility might be the opportunity to reduce the unit cost of education to the point where our society could afford to provide open and equal access to learning opportunities for all members throughout their lives."

"Pay as You Learn; TV Proposal," *Times Educational Supplement*, 2491 February 15, 1963, pp. 308 ff.

J. M. Pettit and D. J. Grace, "The Stanford Instructional Television Network," *IEEE Spectrum*, Vol. 7 May 1970, pp. 73-80.

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The Rand Corporation, 1700 Main Street, Santa Monica, California 90406.

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Audiovisual Instruction, 10 issues, $12 per year, Association for Educational Communications and Technology, National Education Association, Washington, D.C.

AV Communication Review, quarterly, $13 per year, Association for Educational Communications and Technology, National Education Association, Washington, D.C.

Cablecasting and Educational Television, monthly, $6 per year, 10 Poplar Road, Ridgefield, Connecticut 06877.

Educational Broadcasting Review, monthly, $5 per year, Sepulveda Boulevard, Los Angeles, California 90049.

Education-Instructional Broadcasting, quarterly, The Center for Educational Television Overseas, The Studio, Nuffield Lodge (Regents Park), London, N.W.I.

Educational Technology, monthly, $18 per year, 607 Main Street, Ridgefield, Connecticut 06877.

Educational Television, monthly, $18 per year, 607 Main Street, Ridgefield, Connecticut 06877.

ETV Newsletter, bi-weekly, $40 per year, 140 Main Street, Ridgefield, Connecticut 06877.

JCET News, monthly, JCET, 1126 16th Street N.W., Washington, D.C. 20036.

III. INDEXES AND OTHER BIBLIOGRAPHIES

Further reading for the dedicated.

Indexes

Business Periodicals Index. Many items on the monied matters of cable. Look under: Television Community Antenna.

Education Index. Few entries, but useful. Look under: "Television Antennas–Multiple outlet systems."

The ERIC *Research in Education (RIE)*. This monthly index compiled by the Educational Resources Information Center includes annotations of books, reports, speeches, dissertations, pamphlets, etc., both published and unpublished. Every phase of education is covered, including cable television. Begin your search by looking under: cable television, community antennas.

The ERIC *Current Index to Journals in Education (CIJE)*. This monthly index compiled by the Educational Resources Information Center includes listings of all journal articles relevant to the field of education, including articles on cable television. Begin your research by looking under: cable television, community antennas.

Both of these indexes are available in most university and college libraries. *CIJE* is published by CCM Information Corporation, 866 Third Avenue, New York, New York 10022. *RIE* is published by the U.S. Government Printing Office, Washington, D.C. 20402.

Index to Legal Periodicals. A significant number of very significant articles, easy-to-read, and well documented. Look under: "Television–Cable Television."

New York Times Index. Helpful mainly for cable activities in New York and Washington. Look under: "Television and Radio–Community Antenna Television (CATV)."

Public Affairs Information Service Bulletins. Perhaps the most fruitful. Look under: "Television Relay Systems."

Reader's Guide to Periodic Literature. Mediocre, but widely available. Look under: "CATV System."

Other bibliographies:

Don R. Le Duc, "A Selective Bibliography on the Evolution of CATV 1950-1970," *Journal of Broadcasting*, Vol. XV, No. 2 Spring 1971, pp. 195-234.

A wealth of information sources catalogued thus: general reference material (the following by date); CATV history, pre-history through 1945 and pioneering 1945-57; economics and ownership; management, programming and operation; industry trends and surveys; predictions; intermedia competition, economic, legal common carriage, and copyright; and regulation, federal, state and local.

PubliCable, "Bibliography on Cable Television," November 1971, 8 pp.

Sections on: Issues, impact, background, utilization, schools, system planning and public interest, cities, regulation, bibliography and periodicals, with a strong emphasis on education. A position paper is also available from this "consortium of individuals" particularly concerned with cable's non-commercial possibilities.

Write: PubliCable, c/o Harold Wigren, 1201 16th Street N.W., Washington, D.C. 20036; or call: 202/833-4120.

Christopher H. Sterling, *BBB: Mass Media Publications Reporting Service*, Annual Volumes I, II and III $2.00 each. Vol IV starting September, 1972 in monthly installments: $3.50.

Excellent reviews of the latest media publications including cable. Together the BBB's make an outstanding annotated bibliography.

Write: Christopher H. Sterling, Department of Radio-TV-Film, Temple University, Philadelphia, Pennsylvania 19122.

William Stroud, "Selected Bibliography on Telecommunications (Cable Systems)," October 1, 1971, 23 pp., "Addenda to selected..." December 3, 1971 6 pp. "Addenda No. 2," March 15, 1972, 11 pp.

This document covers many telecommunications aspects other than cable TV, though most of these other aspects could use cable systems. Sections on: Introduction, exploratory studies, special research reports/publications, model ordinances, and State of Illinois/City of Chicago hearings on CATV. Prepared by students working with Stroud.

Write: Dr. William Stroud, Department of Communications, University of Wisconsin, Milwaukee, Wisconsin.

IV. CABLE COMMUNICATIONS JOURNALS AND REFERENCE BOOKS

Broadband Information Services Inc., 274 Madison Avenue, New York, New York 10016:

Broadband Communications Report, semimonthly, $48/yr. Clearinghouse on technical development, cable systems, regulation, financing, programming and public access.

Broadcast Management/Engineering, monthly, $15/yr. Each issue contains a "Cable Management/Engineering" supplement.

Broadcasting Publications, Inc., 1735 DeSales Street N.W., Washington, D.C. 20036:

Broadcasting, a newsweekly for both broadcasting and cable, especially good for FCC coverage, $20/yr.

1972-73 Cable Sourcebook, annual reference book, $8.50.

Broadcasting Yearbook, $14.50.

Cable Communications Corporation, 5700 North Portland Avenue, Oklahoma City, Oklahoma 73112:

Cable News, weekly, $12.50/yr. Less coverage than *CATV*, but more interesting editorials.

Challenge for Change Program, National Film Board of Canada, P.O. Box 6100, Montreal 101, Quebec, Canada:

Access. Quarterly. Free. Free, fun and relevant newsletter describing the NFB media projects, of which a significant number involve ½" video and/or cable.

Chicago Journalism Review, 192 N. Clark Street, Chicago, Illinois 60601:

Chicago Journalism Review, monthly with interesting "Cable Report" section, $7/yr. Muckraking comes to cable.

Communications Publishing Corporation, 1900 West Yale, Englewood, Colorado 80110:

CATV Magazine, "Authoritative Newsweekly of Cable Television," $33/yr.

TV Communications, "Professional Journal of Cable Television," $10/yr.

TV CATV Directory of Equipment and Services, $6.95, free with *CATV* subscription.

1972-73 CATV Systems Directory, Map Service and Handbook, $8.95.

Gordon and Breach, 440 Park Avenue South, New York, New York 10016:

Communication, two issues per volume for $12. "A journal devoted to new conceptual, theoretical, and philosophical approaches to the role and consequences of communication in human affairs."

Radical Software. Quarterly (approximately). Issues 1-4, $3 apiece or $10.95 for the set; Issue 5, $3; Volume II (the next 9 issues), $12.50 for individuals, $45 for institutions. "In addition to providing more timely information on media ecology and technology, cable, cassette, etc., we will be diversifying in order to provide a forum for information on newly emerging areas of interest from biofeedback, to practical applications of computer technology, to advances in responsive environments and education." The open forum journal of the cybernetic underground.

National Cable Television Association, 918 Sixteenth St. N.W., Washington, D.C. 20006:

NCTA Bulletin, semimonthly, free to members and letter writers with legitimate excuses. A very informative industry newsletter which keeps one aware of what the industry thinks is important.

National Cable Television Institute, P.O. Box 2616, Clinton, Iowa 52732:

Cable Tech, bi-monthly, $8/yr. The Official Journal of the Institute for PR purposes also attempts to serve as a technical journal.

National Council of Churches, Broadcasting and Film Commission, 475 Riverside Avenue, Room 852, New York, New York 10027:

Cable Information, monthly newsletter, $10/yr. Helpful newsletter for churchmen, educators, and community leaders.

Paul Kagan Associates, Inc., P.O. Box 2732, New York, New York 10001:

Cablecast, biweekly, $300/yr. "Commentary on investments in broadcasting and CATV."

Sony Corporation of America, 47-47 Van Dain Street, Long Island City, New York 11101:

Application Bulletin, $5, but free if politely requested. Volume II includes 23 case examples of Sony equipment use, in business, education, social service and medicine.

Christopher H. Sterling, Department of Radio-TV-Film, Temple University, Philadelphia, Pennsylvania 19122:

BBB: Mass Media Publications Reporting Service, monthly, $3.50. Perceptive reviews of latest communications publications, including cable.

C. S. Tepfer Publishing Co., Inc., 607 Main Street, Ridgefield, Connecticut 06877:

Cablecasting/Cable TV Engineering, monthly, $18/yr. Official Journal of the Society of Cable Television Engineers. Controlled circulation publication.

Educational Television, monthly, $18/yr.

Urban Communications Group, 1730 M Street N.W., Suite 405, Washington, D.C. 20036:

Black Communicator, monthly, $5/yr. Covers broadcast and cable television from a black perspective. They also function as a fine information and consulting service.

Urban Telecommunications Workshop, 276 Riverside Drive, New York, New York 10025:

Urban Telecommunications Forum, monthly, $17/yr. Journal of the current research in using broadband cable communications for solving urban problems.

V. ADDITIONAL INFORMATION SOURCES

Cable Advisory Service, Office of Communication, United Church of Christ, 289 Park Avenue South, New York, New York 10010.

Cable Information Service, National Council of Churches, Broadcasting and Film Commission, Room 852, 475 Riverside Drive, New York, New York 10027. 212/870-2568.

*Cable Television Information Center, 2100 M Street N.W., Washington, D.C. 20037. 202/872-8888.

Citizens Communication Center, 1816 Jefferson Pl. N.W., Washington, D.C. 20036.

Ford Foundation, Office of Public Broadcasting, Stewart Sucherman, 320 East 43 Street, New York, New York 10017. 212/573-4740.

PublCable, c/o Dr. Harold Wigren, DET, National Education Association, 1201 16th Street N.W., Washington, D.C. 20036. 202/833-4120.

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*"The Cable Television Information Center was created by the Ford and Markle Foundations as a part of The Urban Institute to help officials make the vital and necessary decisions about this new technology: decisions which will affect their cities for years to come. Our goal is to provide accurate, objective information–information readily useful to officials who are attempting to define policies and procedures for developing cable in their communities.

While we believe the service will be useful to anyone desiring a grasp of the complexities of cable communications, it is primarily intended for local decision makers.

The primary means of making this information available will be the center's publications service. Prepared by our professional staff, the service will be a continually updated report series concentrating upon issues of immediate interest to decision makers.

Subscribers to the service will pay a one-time charge of $25–a charge which covers only the center's printing and shipping costs–and will immediately receive the first installment of eight reports. And in the future you will automatically receive, without further charge, each new report as it is published, and all new supplements as they are prepared."

A GLOSSARY OF TERMS FOR CABLE TELEVISION

A GLOSSARY OF TERMS FOR CABLE TELEVISION

Based upon the glossary
*compiled by Merry Sue Smoller**

access

This generally refers to the public's right to speak out on, or otherwise use, the broadcast of cable channels. The right may be spelled out in an ordinance, or claimed by individuals or groups. The FCC requires free access to channels, but not to production facilities.

access channels

Government, education, public or leased channels carried on a cable television system. Also known as non-broadcast channels. See also **government and educational channels**, **public access channel**, and **leased channels**.

additional signals

According to FCC regulations, signals that some systems may carry in addition to those required or permitted as minimum service or mandatory carriage. See **carriage rule**.

aerial plant

Cable that is suspended in the air on poles that are often leased from the local telephone or power company.

amplifier

A device consisting of electrical components used to increase the power, voltage or current of a signal, inserted in the cable at least every 3,000 feet to compensate for signal losses on the cable network.

attenuation

The decrease of signal strength as it progresses from source to receiver. It is a function of the transmission medium, distance, and frequencies being transmitted.

augmented channel system

A way of gaining more VHF channel capacity on a conventional single cable system through the installation of subscriber set-top convertors.

bi-directional system

See **two way capability**.

blue sky

The potential of cable television rather than the present actuality; predictions of future uses and applications of cable television focusing on the medium as service rather than entertainment oriented. Often the term carries a perjurative connotation.

branch

A smaller section of cable leading from the trunk past subscriber's home.

broadband

Frequency bandwidths above one megahertz. Broadband communications systems are communications systems that carry a wide frequency range such as broadcast television, cable television, microwave and satellite services. Also known as wideband. See also **narrowband**.

broadcasting-satellite service

A method using a satellite to transmit or relay signals (e.g. broadcasting programs) directly to the general public, either to receivers in individual homes (broadcast satellites) or to community receivers intended for use by a group of the general public at one location (distribution satellites). Also known as the direct reception mode of reception.

cable

This can mean either the actual wire that is the nervous system of cable television (see **coaxial cable**), or it can mean the system itself (see **CATV**, **CTV** and **CIS** for detail on the different phases of cable over the past 25 years).

CATV

This acronym originally referred to the community antenna television system whose sole function was to provide improved reception of broadcast television signals through a tall antenna that served the whole community. The true CATV system was also marked by small channel capacity (often 6 or less) during its prime in the '50's and '60's. Many CATV systems still exist today in small, remote towns. CATV has unfortunately also been used to refer to more modern CTV and CIS systems, resulting in a blurring of fundamental differences.

CIS

A Cable Information System (also community information system or broadband communications network—BCN) is a two-way cable system such as is just now becoming technologically possible, which utilizes its enormous capacity to carry facsimile, computer, and interactive signals of many kinds, in addition to the traditional radio and television channels. To put it more technically, it is a concept requiring a bi-directional, switched, technologically improved, highly reliable, minimum 300 megahertz bandwidth cable system utilizing sophisticated home terminals (with auxiliary equipment such as hard copy printers, alphanumeric keyboards, frame grabbers) capable of interacting with the system's central computer. Separate distribution systems could be inter-connected by microwave or satellite relaying. In addition to entertainment television, a BCN could provide such services as video telephone, computer data exchange, electronic mail, two-way education, meter reading, shopping by TV, two-way burglar alarms, on-demand special information, electronic newspapers and magazines, library services, polling, etc. See also **wired city**.

CTV

This acronym means cable television, particularly the system into which it has evolved in the past few years. Specifically, this means a channel capacity of 12-20 channels and the beginnings of local origination and public access material being carried over the system in addition to the broadcast TV signals. A definition with the more legal-technical specifics is: Any facility that in whole or in part, receives directly or indirectly over the air, and amplifies or otherwise modifies the signals transmitting programs broadcast by one or more television or radio stations and distributes such signals by wire or cable to subscribing members of the public who pay for such service. But such a term shall not include (1) any such facility that serves fewer than 50 subscribers, or (2) any such facility that serves only the residents of one or more apartment dwellings under common ownership, control or management, and commercial establishments located on the premises of such an apartment house.

cablecasting

Television programs originated by a cable television system, and distributed over the cable system, rather than through the air as in broadcasting.

carriage

The carrying on the cable television system of a program being broadcast by a television broadcast station.

channel reuse

Trunk line routing planned so that there is a common point of trunk/sub-trunk feed for each neighborhood. A program on a single channel is erased, or totally deleted, when the trunk crosses the boundary into a new neighborhood, leaving the channel free to be reused. A new program of truly local origination could be inserted at that point to serve that neighborhood, and at the next boundary the process would be repeated.

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*Merry Sue Smoller, Librarian, School of Journalism and Mass Communications, University of Wisconsin, Vilas Communication Hall, Madison, Wisconsin 53706.

carriage rules

FCC rules stipulating what signals a cable system must and may carry. The FCC requires a cable system in a given community to carry as minimum service, on request of the appropriate station, the signals of all television stations (including translator, educational, and significantly viewed stations) licensed to communities within 35 miles of the cable system's community. Systems located in top 50 markets must also carry Grade B signals of educational television stations. Systems in smaller television markets must also carry the Grade B signals of both educational television stations and stations in other smaller markets. Systems located outside definable markets must also carry all Grade B signals. As additional signals, FCC rules permit cable systems in the top 50 markets to carry signals of at least 3 network and 3 independent stations; those in markets 51-100, the signals of at least 3 network and 2 independent stations. All of the systems in those markets, in addition, are entitled to carry 2 distant signals, regardless of whether they are needed to provide the specified minimum. Systems in markets below the top 100 are limited to the carriage of 3 network signals and 1 independent. Those outside any definable market are not limited in the number of signals they can carry. Cable systems are required to carry all local educational stations. If there are no local educational stations, they may import the signals of the closest one. As many foreign language stations may be carried as desired.

cascade

The operation of devices (usually amplifiers) in sequence in a cable system with the output of one device feeding the input of the next.

certificate of compliance

Document giving approval for a cable system to carry broadcast signals after meeting all of the FCC requirements. All new systems must have a certificate of compliance in order to begin operations. Existing systems must obtain one from the FCC before adding new signal carriages, and at the end of the current franchise period or March 31, 1977, whichever comes first.

channel

The segment of the radio frequency spectrum to which a television station is assigned or to which a television camera is tuned when transmitting via radio frequencies. Each television channel requires a bandwidth of 6 megahertz.

channel capacity

The number of separate channels of information that a cable system could deliver from its headend into the subscriber's home. The current range for new systems is 12-34 channels per cable, with 2 or 3 cables being installed in some urban areas.

Class I cable television channel

A signalling path provided by a cable television system to relay to subscriber terminals television broadcast programs that are received off-the-air or are obtained by microwave or by direct connection to a television broadcast station.

Class II cable television channel

A signalling path that is used for carriage of signals that have not been broadcast (i.e. local origination) and are intended to be picked up by a subscriber without use of an auxiliary decoding device.

Class III cable television channel

A signalling path used for carriage of signals that are intended to be received by equipment other than a television receiver or by a television set only after decoding and converting.

Class IV cable television channel

A signalling path provided by a cable television system to transmit signals of any type from a subscriber terminal to any other point in a cable system.

closed-circuit

Any transmission method by which reception is not available to the general public. The receiving equipment (often special apparatus but not generally available) is directly linked to the originating equipment by cable, microwave relay, or telephone lines. Closed-circuit television (CCTV) is designed to be beamed within a given area that is usually much smaller than a network or local station's territory. Extensively used for monitoring in hospitals, police stations, prisons, etc.

coaxial cable

The special kind of wire usually used in cable television systems, which is between ¼-1 inch in diameter. It is called coaxial because it consists of two conductors, one inside the other and having a common axis. Surrounding the inner copper, or copper-sheathed aluminum, wire is a plastic foam insulating layer which is encased by a jacket of seamless aluminum or braided copper wire covered by a durable plastic sheathing. An electromagnetic field is set up between the center wire and its surrounding wire which retains signals within it, thus permitting the cable to carry more signals with less leakage.

communications-satellite service

A method using a satellite to relay signals (e.g. broadcasting programs) to earth stations for direct or indirect distribution by terrestrial transmitting stations. Such relays employing satellites are particularly suited to inter-connecting cable systems through intercity links extending across the continent or overseas. Also known as the retransmission method of reception, or as relay satellites.

community antenna relay service (CARS)

A means of obtaining distant reception through microwave relay links. A broadcast receiving antenna location is established within the good signal reception area of a station. This signal is demodulated and the video and sound are multiplexed on a frequency modulated microwave carrier, then relayed to a distant community. Microwave links can be repeated if necessary (usually every 30-35 miles depending on the terrain and distance). The final receiver, at a cable head end, must demodulate the video and sound and then modulate these program signals into the form suitable for a conventional home receiver.

community antenna television system (see CATV)

contour

The distance of a broadcast station's service area, an irregular shape surrounding the transmitter which is determined by signal-strength measurements in the field.

convertor

A device for changing the frequency of a signal. Headend convertors change signals from frequencies at which they are broadcast to clear channels or from UHF to VHF, since cable cannot carry UHF. Set-top convertors change signals from the frequencies at which they are sent over the cable (sometimes above VHF) to channels that the television set can pick up, or to a clear channel. The set-top convertor (also known as a subscriber convertor) extends the capacity of the home television receiver beyond 12 channels.

dedicated channel

A channel (in use or available on demand) solely devoted to a particular type of purpose or service, i.e., education, police, meter reading, library.

designated channels

Government, educational, and public access channels carried on a cable television system. The FCC ruled, in its June 1972 Reconsideration of the Report and Order, that no additional designated channels (beyond the original one educational, one government, one public access) can be carried or reserved on a cable system without FCC approval based on petition and demonstration of need. See also **government and education channels** and **public access channel.**

digital return

This is one of the narrowband forms of two-way cable communication. A subscriber, probably equipped with a small 12-button keyboard, would transmit signals back to the headend by using the keyboard. The keyboard could vary from the simplest yes-no switch to a full computer keyboard.

distant signal

The signal of a television broadcast station beyond the Grade B contour of that station. Generally, signals originating at a point too distant to be picked up by ordinary television reception equipment.

distribution system

A collective term for the part of a cable system used to carry signals from the headend, or the receiving point of the cable system, to the subscribers' receivers.

downstream

The direction in a cable system from the headend to the terminals. See also **upstream**.

drop

A small branch of cable which connects the antenna terminals on the back of the subscriber's television receiver to the feeder cable in the street.

dual cable system

See **multiple cable system**.

duplex

A cable system with two-way capability.

exclusivity

The contractual right to be the sole exhibitor of a program in a particular area during a particular period of time. FCC rules prohibit cable systems in the top 50 markets from carrying any syndicated programming for one year after its first appearance in any market and then for the life of the contract under which it is sold to a local station. In markets 51-100, different kinds of non-network material are protected for varying periods of time up to two years.

facsimile

Printed material converted into electronic signals carried via the cable to the subscriber's terminal where they are reconverted into printed material.

Federal Communications Commission (FCC)

The FCC is composed of six commissioners and a chairman. They are appointed by the President and serve for seven year terms.

FCC First Report and Order (1965)

The FCC's general rules for microwave-served cable systems, including the carriage and non-duplication rules.

FCC Second Report and Order (March 1966)

The FCC asserted jurisdiction over all CATV systems and placed severe restrictions on the carriage of distant signals into the top 100 markets.

FCC Notice of Inquiry and Proposed Rule Making (December 1968)

Imposed a freeze upon major market penetration by CATV systems so that facts could be gathered about how to control penetration. The effect was to stifle further penetration into the top market areas where 90% of the U.S. population was located.

FCC Report and Order (February 1972)

FCC rules to regulate and promote the growth of cable television into the major metropolitan areas. Detailed regulations on distant signals, access channels, technical standards, regulatory relationships and other areas, based on a compromise agreement between White House officials, leaders of the film, cable and broadcast industries and Dean Burch, the chairman of the FCC. Effective March 31, 1972.

feeder

A comparatively short run of cable which may parallel the main trunk cable either forward, by doubling back from a junction, or branching off to serve a local area. Subscriber taps are put only on the short feeders to avoid the negative cumulative effect of these electrical discontinuities on the trunk.

film chain

The equipment used to show film on television. Consists of a film projector, a slide projector, a multiplexer, and a television film camera.

Fortnightly case

United Artists v. Fortnightly Corporation (June 1968). Fortnightly Corporation was a CATV firm with systems in West Virginia. United Artists charged that the systems were rebroadcasting programs on which United Artists owned copyrights and that this was an infringement of copyright law. This became a test case in the Supreme Court when Fortnightly appealed lower court decisions in favor of United Artists. The Supreme Court found that CATV systems were not liable for payment of copyright royalties since "a CATV system no more than enhances the viewer's capacity to receive the broadcaster's signals" and "has little in common with the function of broadcasters" since "CATV operators, like viewers and unlike broadcasters, do not perform the programs they receive and carry."

frame grabber

A common term for the electronic device at the subscriber's terminal used for storing single television frames (e.g., a silicon storage tube or a modified video tape recorder) for display. Also known as a frame snatcher. See also **single frame capture** and **time-sharing**.

franchise

A commonly used term for an agreement between a cable operator and a local government setting out the specific rights and responsibilities of each for the construction and operation of a cable facility in a specific political subdivision. In granting a franchise to the cable operator, the community grants more than the right to do business. It grants the right to use public right of way into private property. According to FCC regulations, a public proceeding must accompany the franchise grant; the franchise period should not exceed 15 years; the system must extend service to all areas of the franchise community where practicable; the system must begin construction within one year after the certificate of compliance is issued; franchise fees to the municipality (3% suggested) must be reasonable.

frequency bandwidth

The number of hertz (cycles per second) in the band; based upon the information transmitted and method of transmission.

government and educational channels

The FCC requires cable systems in the top 100 markets to set aside one channel for education use and one channel for state and local government use on a developmental basis. Upon completion of the basic trunk line, for the first five years these two channels will be made available free. After the developmental phase the FCC will determine whether to expand or curtail the free use of channels for such purposes. Only use of cable channel is free; production costs may be charged to users.

grandfathering

A method of protecting existing institutions from subsequent changes in regulations. Cable systems already in operation on the effective date of new rules are permitted to continue operation without regard to new technical standards or signal carriage requirements since it would be unfair to make them comply with a law that was written after they were built. Cable systems grandfathered by the FCC Report and Order (all systems in operation or authorized to carry signals before March 31, 1972) are required to comply with the new regulations by March 31, 1977, or on renewal of their franchise, whichever comes first.

graphics

All two-dimensional visuals especially prepared for display on television, i.e., maps, charts, special illustrations, title cards.

guerrilla television

Alternate video movement consisting of groups usually using portable ½ inch video tape systems to create an alternate information network (in contrast to the Establishment centralized networks to which they have been denied access). Many of the alternate video groups cablecast their tapes over the public access channels.

hard copy

A permanent copy, usually printed on paper, of information converted from electronic signals carried on the cable to the subscriber's terminal. See also **soft copy**.

hardware

Actual physical equipment, like cameras, recorders, antenna, and so on, as distinguished from information and programming, which are software.

headend

The electronic control center, located in a small building at the start of a cable system (usually near or at the antenna site), where incoming television signals are amplified, filtered and converted, if necessary, to cable system channels. Sometimes a small studio is incorporated into the same building.

hertz

The name of the unit used to describe the frequency of electrical signals, or the bandwidth required by such signals. One hertz equals one cycle per second; one kilohertz equals one thousand cycles per second; one megahertz equals one million cycles per second of electrical signal.

hub-network switched system

A type of system requiring that each subscriber terminal be connected to a switching center located nearby. All programs would have the same carrier frequency. A single channel converter at each subscriber terminal would provide usable signal for a standard television set. Channel selection would be by a telephone dial or pushbutton arrangement working back through the drop cable to the local switching center. Thus, only the channel dialed would be connected at that switching center to a particular drop cable. The problem of getting multiple programs on the same channel frequency to each local switching center requires a separate cable for each channel from the headend. This results in a hub-structured network (sometimes describes as star-shaped), structurally similar to telephone networks rather than the conventional tree-structured cable network. Also known as a dedicated drop, switched, discade, or rediffusion system.

independent station

A commercial television broadcast station that generally carries in prime time not more than 10 hours of programming per week offered by the three major networks.

instructional television (ITV)

A television system used primarily for formal instruction.

instructional television fixed service (ITFS)

A television system operating at the 2,500 megahertz frequency set aside by the FCC for instructional television utilization. Special convertors are needed to receive the signal, and there is no two-way capacity.

interactive mode

A system that allows two-way communications, with each part of the system affecting the others. See also **two-way capability**.

interconnection

In cable this refers to the linking of separate systems for program circulation and resource-sharing purposes. A potentially thorny political problem in metropolitan areas with a large number of potential franchising bodies and thus potentially separate (and unconnected) cable systems. In many such areas school district boundaries are not coterminous with municipal boundaries, making interconnection essential for any significant educational use.

leased channels

According to FCC regulations, after cable systems in the top 100 markets have satisfied the priority of providing one free public access channel as well as the free channels for education and government they may make available for leased uses the remainder of non-broadcast use channels. If the public access, educational, and governmental channels are not being used, these channels may also be used for leased operation.

local distribution service (LDS)

Short microwave relay systems that extend cable services up to 20 miles (the present cable system limit is 10 miles) to serve smaller communities or population clusters around a cable service area.

local origination

Programming produced by the local cable operator. The program content might be on a film or videotape produced elsewhere and sold or leased to a cable operator, or it might indeed be programs produced locally. According to FCC regulations, all systems with 3,500 or more subscribers are required to originate programming.

local station

A television broadcast station which places a Grade B or better signal over the area in which the cable system operates.

major television market

The specified zone of a commercial television station licensed to a community listed as one of the 100 major television markets by the FCC in its Report and Order. This list is derived largely from American Research Bureau's 1970 prime-time households ranking. Ninety percent of the U.S. population lives in the major market areas. Also known as a larger television market or a top 100 market.

mandatory carriage

Signals that a cable system must carry in accordance with FCC regulations. See **carriage rules**.

megahertz (see **hertz**)

microwave

(1) Extremely short waves on the order of 1,000 megahertz and higher.
(2) A method whereby television signals may be transported from one place to another. See also **community antenna relay system (CARS)** and **local distribution service (LDS)**.

Midwest Video case

Midwest Video Corporation v. FCC (June 1972). Landmark decision by the Supreme Court in which the FCC was sustained in its power to compel compliance to its cable regulations. Midwest Video Corporation had challenged the FCC 1969 rule requiring CATV systems with more than 3,500 subscribers to originate local programming. The federal appeals court in St. Louis had voided the program origination requirement on the grounds that it was beyond FCC authority.

minimum channel capacity

The minimum number of channels a cable system must provide in accordance with FCC regulations. Systems in the top 100 markets must provide 20 channel capacity (actual or potential). Also for each broadcast signal carried, they must provide an additional channel suitable for non-broadcast signals (Class II and III cable television channels).

mixer

The audio control console in a television production studio.

modulation

The process whereby the original information (e.g. the picture from a television studio) is translated into radio energy for transmission through space. The message, whether picture or any other kind of signal, consists essentially of an energy pattern that can be translated and transferred from one medium to another, each capable of duplicating the pattern of amplitude and frequency of which the signal consists.

monitor

A special type of television receiver. It is not tunable to channels, and is used for viewing video tapes, or to display the picture transmitted by a live television camera.

multiple cable system

A system using more than a single cable in its distribution system. For example, an existing 12 channel system can be enlarged to a 24 channel system by installing a completely duplicate plant, or dual cable system, which carries the same 12 channels but with different program material. At the subscriber's set would be a switch so that he could choose channels on Cable A or Cable B. By extension, there could be Cable C, D, and so on.

multiple system operator (MSO)

A company that operates more than one cable television system, and generally used to refer to the larger such operators.

multiplexing

More than one signal sent in the same channel without mixture. Division can be by frequency, time, or space.

narrowband

Frequency bandwidths below one megahertz. Narrowband communications systems are those that carry a narrow frequency range, such as telephone systems. See also **broadband**.

National Cable Television Association (NCTA)

The national trade organization of the cable television industry. Chartered in 1952, it has an active membership of about 1,073 CATV systems and 237 associate members (manufacturers and suppliers of CATV equipment and others having an interest in the industry). NCTA represents the industry before the FCC, Congress, state regulatory bodies and on technical television industry committees.

noise

The accidental, unintended, and normally unwanted static received or transmitted as electrical impulses. For example, show (dancing black or white spots on the picture tube having no recognizable shape or period) is a form of noise created by thermal effects in the input circuits of amplifiers placed along the cable.

non-broadcast channels

Channels whose direct source is other than a broadcast TV station. See **access channels, Class II** and **Class III cable television channels**. See also **minimum channel capacity**.

nonduplication

Not carrying on the cable system from another television broadcast station the same program being broadcast by a local television station. FCC regulations prohibit a cable system from such simultaneous duplication.

Office of Telecommunications Policy (OTP)

Established by order of the White House, the Office of Telecommunications Policy aids in formulating the Administration's long range cable television policy; in preparing legislation for submission to Congress; and acting as a go-between in disputes between interested parties such as the FCC, the NCTA, and the NAB. Director: Clay T. Whitehead, 1800 G Street, Washington, D.C. 20504.

ordinance

An official resolution by a local political body regulating an activity within the legally defined political subdivision. An increasingly common practice is for a local political body to pass an enabling ordinance to serve as a guide for potential franchise applicants. Such an ordinance sets forth the ground rules which any franchise holder would have to work under (i.e., minimum standards of performance) and sets up a systematic procedure for applying for a franchise.

orgination cablecasting

Programming (exclusive of broadcast signals) carried on a cable system over one or more channels and subject to the exclusive control of the cable operator.

pay cable

A leased channel concept that enables cable television subscribers to bring in closed circuit programs on a per item basis. Scrambled signals are sent over the cable that can be decoded only by the insertion of the proper key or card into a black box resting on the subscriber's TV set. The subscriber would be billed for such service in addition to the regular cable service charge. Also known as subscription television or pay television.

penetration

The percentage of people to whom cable is available who are actually subscribers.

Picturephone (trade name)

A system of transmitting video and audio information via a relatively narrow bandwidth involving digital encoding. Intended as a two-way system to enhance telephone intercommunication.

plant

The equipment in a cable system.

point-to-point service

A characteristic of a switched system which enables a sender to transmit a message (voice, video or data information) on the cable directly to the desired receiver(s) rather than to the general public. Point-to-point service can be in the form of either discrete address, from one point to another single point, or multiple address, from one single point to a number of selected specific points.

portapak

A relatively inexpensive, fully battery operated portable videotape recorder and camera. Commonly utilizes ½ inch videotape.

program origination

Presenting a program on the cable system which has been originated by the system. In October 1969, the FCC, reversing its past position, permitted all CATV systems to originate their own programming. The FCC also required systems with over 3,500 subscribers to originate programming by January 1, 1971 and allowed all systems to carry advertising.

public access channel

FCC rules require that cable systems in the top 100 markets provide one free, dedicated, non-commercial public access channel available at all times on a non-discriminatory basis. The system operator is obliged to provide only use of the cable channel on a free basis; production costs (aside from studio presentations not exceeding five minutes) may be charged to users.

rediffusion system

See **hub-network switched system** and **switched system.**

retrofitting

The adding of additional cable or different amplifiers to a distribution system after it has been installed. Often done to increase channel capacity, or to provide two-way capability.

signal

The coherent, significant, and intentional components of information (such as sound or picture) received, or transmitted, as electrical impulses. Signals are noted in terms of strength (voltage) and frequency (cycles per second).

single frame capture (SFC)

A method of capturing and holding a single television frame of pictorial or alphanumeric information retrieved by random access (or nearly so) from a central computer facility with data and video files, for display at the subscriber's terminal. Services possible through SFC (augmented with a hard copy printer) include electronic news, transportation schedules, consumer information, job availabilities, directories, library catalogs, dictionaries and encyclopedias, advertising rates and credit ratings for businesses, recreational games and slide shows, and electronic mail.

siphoning

A process in which cable systems reduce the advertising revenue and programming of broadcasting by purchasing the program rights. A controversial aspect of the cable broadcast struggle.

smaller television market

The specified zone of a commercial television station licensed to a community that is not listed as one of the major (top 100) television markets. Also known as minor markets.

soft copy

Information displayed on the picture tube (cathode ray tube) of a television receiver.

software

The working materials from which a program is created that will be played out on a piece of hardware. The working materials may include scripts, written narration, audio or visual aids, etc., especially created or assembled for the production, as well as the knowledge of how to use the equipment.

structured dualism

A term for the sharing of the regulation of cable systems by the FCC and state and local governments.

subscriber

A person who pays an installation charge and monthly fee to a cable system operator for providing a connection to the cable system and for the programs and services carried on the cable.

switched system

A cable system designed with the capability to send messages (such as voice, video, or data information) to or from any individual point, or designated address, on the system. A switched system may be circuited switched where a direct transmission path is established between sender and receiver or message switched where messages are relayed to the receiver by switching centers in a store and forward manner.

switcher

In television production, a control that allows the selection of one image from any of several cameras operating simultaneously to be fed into the television display or recording system.

sync

Synchronization. The maintenance of one operation in step or phase with another, such as the simultaneous projection of picture and sound.

TV Pix case

TV Pix, Inc. v. Taylor (November 1968). An important case setting a precedent for the regulation of CATV as a public utility by a state. The U.S. District Court of Nevada upheld a state law allowing the Nevada Public Service Commission to regulate CATV. This decision was upheld by the Supreme Court in February 1970.

terminal

The equipment on the subscriber's end of the cable. This varies from a simple plate to which wires from the antenna outlet on the set are attached to sophisticated devices which might include convertors, keyboards, videotape recorders, and mini-computers.

35 mile zone

The area within each market to which FCC regulations are applicable. The area is defined as a zone of 35 miles radius surrounding a specified reference point (often the main post office) in each designated community in the market. The purpose is to carve out the market's central city, suburbs, and nearby communities on which stations generally rely for their principal audience support. All cable systems must carry the signals of all stations licensed within 35 miles of the cable system's community.

time-sharing

(1) Time segments on a dedicated channel shared by various groups such as schools libraries, police stations, rather than a separate channel designated for each particular use.
(2) Sharing of channel time by sending one transmission of a picture (a frame) capturing it on special terminal equipment (frame grabber) for local reproduction and viewing and releasing the remaining available 1799 frame transmission opportunities in that same minute to serve someone else.

top 100 markets

See major television market.

transmission

Sending signals from one point to another.

tree-network

The conventional cable distribution network that includes the cable and all the appurtenant devices necessary to carry the signals from the headend to each of the subscriber's terminals. It is a tree network where the product from the root is carried through the trunk and then through the branches to the individual stems which feed each individual leaf.

trunk

The backbone or main line of the cable system. This main coaxial cable carries signals from the headend to the extremities of the area served with the minimum possible number of amplifiers (generally 3-4 to the mile) and no subscriber taps.

two-way capability

Bidirectional transmission. A cable system capable of carrying information both downstream from the headend to any point in the network and upstream from any point on the network back to the headend. All downstream communications are delivered simultaneously to all subscribers, including even messages addressed to specific subscribers which are, however, recognized and accepted only by the properly addressed subscriber terminal. Upstream communications must be limited to one at a time per channel to avoid chaos. This is done by time-sharing in which each subscriber is alloted a time segment in which to transmit the information to the central collection point. A computer at the central point interrogates each subscriber terminal in turn by suitable address code. Upon receipt of the correct code, the addressed terminal transmits a stored message back to the collection point. The interrogation rate is fast enough to give the subscriber the impression of acfually initiating the transmission of information. Under FCC regulations, all systems in the top 100 markets must have return capacity on "at least non-voice basis" by March 31, 1977.

UHF channels

The ultra high frequency part of the spectrum allocated for television broadcasting, comprising channels 14 through 83.

upstream

The direction in the cable system from the terminals to the headend.

VHF channels

The very high frequency portion of the spectrum allocated to television, comprising channels 2 through 13.

videotape

Thin acetate or mylar type, coated with magnetic material, used to record and store video and audio information. There are five standard widths: two inch, used by television studios in quadraplex machines; one inch, often used by institutions with closed-circuit systems; three-quarter inch; half inch, used in many portable VTR systems; and quarter inch. Video tape is obtainable in two formats: (1) video cassette: the tape moves in a continuous loop encased in a container; (2) reel-to-reel: two reels move the tape from one reel to another. Usually connotes non-encased reels.

videotape recorder (VTR)

The videotape process works through a camera or other transmitter inputting a magnetic impulse onto a coated tape (which is much the same as audio tape). Because there is no chemical process involved, once the signal is recorded it is immediately ready for replay. Videotape is re-usable; it can be erased and re-recorded. Each reel or cassette is good for up to fifty different recordings with upwards of a thousand playbacks possible. The soundtrack is automatically synced to the image and has the same characteristics as regular audiotape recorders. Live feedback is available since a video camera attached to a VTR and feeding into a TV set will give a real-time image of whatever the camera is pointed at.

wired city

A concept in which a cable system would provide all of an urban area's telecommunication facilities. All television signals would be placed in two-way systems that would carry telephone and data traffic as well. Wired cities could be interconnected via satellite or microwave relay to produce a wired nation: internationally connected, a global village.

zero sum game

A situation in which whatever one party gains, another loses. The changes always add up to a zero sum, as there is only a fixed, finite amount to be distributed. In a non-zero sum game, there is a variable amount to be distributed, depending on such characteristics as the level of cooperation, and so the changes add up to a non-zero sum. The relationship between educational systems and cable systems is, or should be, a non-zero sum game.

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